DOCUMENT RESUME

ED 302 462 SO 019 544

AUTHOR Searle, Barbara W.; And Others
TITLE Improving the Quality of Textbooks in China. World Bank Discussion Papers 30.
INSTITUTION World Bank, Washington, D. C.
REPORT NO ISBN-0-8213-1081-1
PUB DATE 88
NOTE 103p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Elementary Secondary Education; Foreign Countries; Higher Education; *Improvement Programs; Operating Expenses; Resource Allocation; *Textbook Publication; *Textbooks
IDENTIFIERS *China; Evaluation Reports

ABSTRACT

The primary, secondary, and higher education textbooks used in China today date from the late 1970s which makes them inadequate for the current stress on science and technology in education. While 70 percent of the higher education textbooks are mimeographed, unedited manuscripts, the majority of published books are printed on newsprint quality paper with small pages, narrow margins, and poor illustrations and line drawings, and the pages are too crowded with print. This evaluation report discusses and offers recommendations for: (1) the financial management of textbook production and sales; (2) the implementation of upgrading the textbooks; (3) the educational effectiveness of textbooks; (4) textbook distribution; and (5) the projected work force needed for the publication process. Appendix 1 contains charts and tables of educational government agencies, publishing houses, and publishers involved with the production, while appendices 2 and 3 contain data tables of education statistics and the estimated cost for publication. Appendix 4 is a glossary of printing terms, and appendix 5 contains an eight-item annotated bibliography. Tables are included. (DJC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED302462

SO

World Bank Discussion Papers

Improving the Quality of Textbooks in China

Barbara W. Searle and Michael Mertaugh with Anthony Read and Philip Cohen

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

JAMES FEATHER

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

SO 019 944

BEST COPY AVAILABLE

RECENT WORLD BANK DISCUSSION PAPERS

No. 1. Public Enterprises in Sub-Saharan Africa. John R. Nellis

No. 2. Raising School Quality in Developing Countries: What Investments Boost Learning? Bruce Fuller

No. 3. A System for Evaluating the Performance of Government-Invested Enterprises in the Republic of Korea. Young C. Park

No. 4. Country Commitment to Development Projects. Richard Heaver and Arturo Israel

No. 5. Public Expenditure in Latin America: Effects on Poverty. Guy P. Pfeffermann

No. 6. Community Participation in Development Projects: The World Bank Experience. Samuel Paul

No. 7. International Financial Flows to Brazil since the Late 1960s: An Analysis of Debt Expansion and Payments Problems. Paulo Nogueira Batista, Jr.

No. 8. Macroeconomic Policies, Debt Accumulation, and Adjustment in Brazil, 1965-84. Celso L. Martone

No. 9. The Safe Motherhood Initiative: Proposals for Action. Barbara Herz and Anthony R. Measham [Also available in French (9F) and Spanish (9S)]

No. 10. Improving Urban Employment and Labor Productivity. Friedrich Kahnert

No. 11. Divestiture in Developing Countries. Elliot Berg and Mary M. Shirley

No. 12. Economic Growth and the Returns to Investment. Dennis Anderson

No. 13. Institutional Development and Technical Assistance in Macroeconomic Policy Formulation: A Case Study of Togo. Sven B. Kjellstrom and Ayite-Fily d'Almeida

No. 14. Managing Economic Policy Change: Institutional Dimensions. Geoffrey Lamb

No. 15. Dairy Development and Milk Cooperatives: The Effects of a Dairy Project in India. George Mergos and Roger Slade

No. 16. Macroeconomic Policies and Adjustment in Yugoslavia: Some Counterfactual Simulations. Fahrettin Yagci and Steven Kamin

No. 17. Private Enterprise in Africa: Creating a Better Environment. Keith Marsden and Therese Belot

No. 18. Rural Water Supply and Sanitation: Time for a Change. Anthony A. Churchill, with the assistance of David de Ferranti, Robert Roche, Carolyn Tager, Alan A. Walters, and Anthony Yazer

(Continued on the inside back cover.)

World Bank Discussion Papers

Improving the Quality of Textbooks in China

Barbara W. Searle and Michael Mertaugh with Anthony Read and Philip Cohen

The World Bank
Washington, D.C.

Copyright © 1988
The World Bank
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

All rights reserved
Manufactured in the United States of America
First printing June 1988

Discussion Papers are not formal publications of the World Bank. They present preliminary and unpolished results of country analysis or research that is circulated to encourage discussion and comment; citation and the use of such a paper should take account of its provisional character. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent. Any maps that accompany the text have been prepared solely for the convenience of readers; the designations and presentation of material in them do not imply the expression of any opinion whatsoever on the part of the World Bank, its affiliates, or its Board or member countries concerning the legal status of any country, territory, city, or area or of the authorities thereof or concerning the delimitation of its boundaries or its national affiliation.

Because of the informality and to present the results of research with the least possible delay, the typescript has not been prepared in accordance with the procedures appropriate to formal printed texts, and the World Bank accepts no responsibility for errors.

The material in this publication is copyrighted. Requests for permission to reproduce portions of it should be sent to Director, Publications Department at the address shown in the copyright notice above. The World Bank encourages dissemination of its work and will normally give permission promptly and, when the reproduction is for noncommercial purposes, without asking a fee. Permission to photocopy portions for classroom use is not required, though notification of such use having been made will be appreciated.

The most recent World Bank publications are described in the catalog *New Publications*, a new edition of which is issued in the spring and fall of each year. The complete backlist of publications is shown in the annual *Index of Publications*, which contains an alphabetical title list and indexes of subjects, authors, and countries and regions; it is of value principally to libraries and institutional purchasers. The latest edition of each of these is available free of charge from Publications Sales Unit, Department F, The World Bank, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A., or from Publications, The World Bank, 66, avenue d'Iéna, 75116 Paris, France.

Barbara W. Searle is an education specialist and Michael Mertaugh a senior economist in the Asia Regional Office of the World Bank. Anthony Read is director of the Book Development Council of the Publishers Association of the United Kingdom and a consultant to the Bank; Philip Cohen is a printing production consultant.

Library of Congress Cataloging-in-Publication Data

Improving the quality of textbooks in China.

(World Bank discussion papers ; 30)
Bibliography: p.
1. Textbooks--China. I. Searle, Barbara.
II. International Bank for Reconstruction and
Development. III. Series.
LB3048.C6I46 1988 371.3'2'0951 88-17133
ISBN 0-8213-1081-1

ACKNOWLEDGMENTS

This report was prepared on the basis of two missions to China. The first, comprising Ms. Barbara Searle (Educator, Mission Chief), Mr. Anthony Read (Publishing Consultant) and Ms. Terrice Bassler (Operations Assistant), visited China from May 23 to June 5, 1986, to conduct preliminary investigations. The second, comprising Ms. Searle (Mission Chief), Mr. Michael Mertaugh (Senior Economist), Mr. Read, Mr. Philip Cohen (Print and Production Consultant), Mr. Wang Jian Liang (Education Consultant) and Ms. Premjit Dhillon (Operations Assistant) visited China from November 9 to 28, 1986. Information was gathered in Beijing, Shanghai, and Jiangsu Province and, Inner Mongolia and Xinjiang Autonomous Regions. The work was conducted in close cooperation with the State Education Commission. In particular, officials from the Planning and Finance Department, the Foreign Investments Loan Office, the two offices responsible for textbook development, the People's Education Press and the Higher Education Publishing House were instrumental in assuring the success of the work of both missions. We express our appreciation to all the many officials in Beijing and other locations who shared their time and information. The present paper draws substantially on a consultants' report, "Educational Publishing in the People's Republic of China" by A. Read and P. Cohen.

CURRENCY EQUIVALENTS

The Chinese currency is called Renminbi (RMB)
It is denominated in Yuan (Y)

US$1.00 = Y 3.70
Y 1.00 = US$0.27
(1986)

FISCAL YEAR

January 1 - December 31

ACADEMIC YEAR

September 1 - August 31

ABBREVIATIONS

gsm	=	grams per square meter
HEPH	=	Higher Education Publishing House
PEP	=	People's Education Press
SEdC	=	State Education Commission
XHS	=	Xinhua Shudian

Annex 4 contains a glossary of printing terms

Table of Contents

		Page No.
SUMMARY AND RECOMMENDATIONS		i - vi
I.	INTRODUCTION	1
II.	THE CONTEXT	2
	Educational Reform and Expansion	2
	The Policy Framework for Textbook Provision	4
	Economic Reform	4
	Textbook Publishing in China	6
	Current Performance	6
	The Institutional Framework	7
III.	CHINA'S PLANS FOR QUALITATIVE IMPROVEMENT	10
	Improving Primary and Secondary Textbooks	10
	Improving Production Standards	10
	Upgrading Content	11
	Increasing Variety	12
	Improving Textbooks for Higher Education	13
	Increasing Variety	15
	Modernizing Content	16
	Improving Presentation of Technical Material	17
	Diversifying Distribution	17
	Technological Upgrading	18
	Upgrading Typesetting	18
	Upgrading Printing	19
	Upgrading Mimeographing	20
	Improving Skills	20
	Commercializing Textbook Publishing	22
	Creating and Managing Book Inventories	22
	Improving Distribution	23
	Increasing Efficiency	24
IV.	COSTS AND FINANCING OF TEXTBOOK PROVISION	25
	Introduction	25
	Cost Concepts	25
	Textbook Prices	26
	Current Textbook Production Costs	29
	Costs of the Proposed Improvements	34
	Financing of Textbook Improvements	40
	Setting Priorities for Investment	42

Page No.

TABLES IN TEXT

2.1 Actual and Projected Enrollments and Gross Enrollment Ratios..... 4
2.2 Book Sales: 1985..... 6
2.3 Textbook Provision: 1985..... 7
3.1 Expansion Targets: Higher Education..... 15
4.1 Estimated Breakdown of Unit Financial Costs of Textbook Production 1985..... 31
4.2 Comparison of Chinese and Hong Kong Textbook Production Costs Under Current Production Standards..... 33
4.3 Unit Recurrent Cost of Improved Textbooks: Full Upgrading as per Government Proposal 35
4.4 Projected Impact of Textbook Upgrading on Total Recurrent Cost of Textbooks..... 37
4.5 Comparison of Chinese and Hong Kong Textbook Production Costs Under Full and Intermediate Upgrading Options..... 39
4.6 Summary Estimate of Costs of Textbook Upgrading According to Two Upgrading Options: Annual Costs by Cost Category..... 40

ANNEXES

1. Institutional Arrangements
   - Chart 1: Organization Chart for SEdC
   - Chart 2: Organization Chart for PEP
   - Chart 3: Organization Chart for HEPH
   - Table 1: Institutional Framework for Textbook Provision: Role of State Commissions/Ministries/Bureaus
   - Table 2: Procedures for Development and Distribution of Primary and Secondary Textbooks
   - Table 3: Compiling Committees for Higher Education
   - Table 4: State Publishing Houses Responsible for Publishing Teaching and Learning Materials for Institutions of Higher Education
   - Table 5: Provincial Publishing Houses Responsible for Publishing Technical Material for Institutions of Higher Learning
   - Table 6: University Publishers

2. Data Tables, Education:
   Table 1: State Unified Textbooks for Primary and Secondary Schools by Type and Price
   Table 2: Number of Students in Primary and Secondary Schools, 1895-2000
   Table 3: Production of Primary and Secondary Teaching Materials, 1985-2000
   Table 4: Production of Teaching and Learning Materials Between 1981-85: Higher Education Publishing House
   Table 5: Number of Printed Teaching Materials in Some Key Institute and Universities in 1985
   Table 6: Publication of Textbooks for Universities, Colleges, Polytechnic Schools, 1981-1985
   Table 7: Schedule for Primary and Secondary Textbook Production

3. Data Tables, Costs:
   Table 1: Price Schedule for Textbooks
   Table 2: HEPH Speciment Price Calculations
   Table 3: Capital Requirements to Meet Year 2000 Targets: Primary and Secondary
   Table 4: Capital Requirements to Meet Year 2000 Targets: Higher Education
   Table 5: Relation of Print Run to Profitability for Recently Published Higher Education Textbooks

4. Glossary of Printing Terms

5. Bibliography

Summary and Recommendations

1. Since the founding of the People's Republic, the Government of China has recognized the importance of textbooks and has endeavored to supply them to all students. The present system succeeds in providing a full set of inexpensive textbooks each year to all of the approximately 200 million students, at all levels of the education system. This requires the production, distribution and sale of about 2.6 billion textbooks annually. China's achievement in successfully supplying textbooks is indeed extraordinary.

2. Nevertheless, although the number of textbooks is adequate, Chinese educators recognize deficiencies in both content and production quality. The primary and secondary books now in use were prepared in the late 1970s, are commonly out-of-date and considered inappropriate for the new stress on science and technology. Books for higher education suffer these deficiencies even more acutely. Almost all titles are printed on 52-gm letterpress paper, which is similar in quality to newsprint, and are covered with paper scarcely heavier than the inside pages. Under classroom conditions, such books deteriorate quickly. Page size is small, about 13 by 18.5 cm, margins are narrow, and pages are crowded. Illustrations reproduce indistinctly on the lightweight paper and line drawings tend to be small and inadequately labeled and captioned. Only about 30% of the textbooks for higher education are published books; the remainder are manuscripts prepared for each institution and mimeographed and bound for sale to students. The production quality of mimeographed material is lower than that of the published books and, typically, the manuscripts have not been edited. Finally, at all levels, there is rarely more than one official textbook for each subject and grade, a degree of uniformity that is clearly inappropriate in a country as large and diverse as China.

3. In the light of these problems, the Chinese government has adopted ambitious plans to raise the quality of textbooks. Work has already begun on a new cycle of textbooks for primary and secondary levels, which will be ready for use in 1990. The proportion of published textbooks for higher education is expected to increase from 30 to 60% over the next decade. Further objectives are to increase the variety of textbooks available, both in methodological approach and in sophistication of treatment, to upgrade content levels and quality of authorship, and to significantly improve production and design quality of books by the use of better paper, larger format, more color, and better covers and binding, which in turn will require a substantial investment in the upgrading of typesetting, printing and paper provision.

4. The paper examines the Government's plans for textbook upgrading and finds them justifiable on pedagogic grounds, and financially affordable. Primary and secondary texts would be improved through a phased program that

would: (a) improve production quality, by increasing paper weight and page size of all texts, and adding color to the texts for Chinese, science and mathematics used in early primary grades (paras. 3.3, 3.4); (b) bring the content up to date and introduce more effective pedagogy into the presentation of material (paras. 3.5-3.8); and (c) increase the variety of texts available, to meet the needs of different localities and students of different capabilities (paras. 3.9-3.12). Improved production quality would allow more effective use of illustrations, which are important pedagogical tools for teaching about language, science and mathematics. Color, which has been shown to enhance the effectiveness of written instructional materials, particularly for younger children, would be added to illustrations on a selective basis.

5. The program to upgrade texts for higher education has two objectives: to increase quality of texts while at the same time meeting the demand for larger numbers of books arising from projected increases in enrollment (para. 2.3) and to shift from mimeographing to publishing of texts (para. 3.13). The program would: (a) increase the variety of texts available for individual courses (para. 3.14, 3.15); (b) modernize the content of texts (para. 3.16, 3.17); (c) improve the presentation of technical material (para. 3.18); and (d) diversify the system for distributing textbooks (para. 3.19). Accomplishing the program for upgrading would require technological improvements in typesetting, printing and mimeographing (para. 3.20-3.30) and improved procedures in publishing, printing and distribution (para. 3.31-3.38).

6. After describing the setting and planned improvements, the paper goes on to examine the current structure and the prospective evolution of textbook production costs under the proposed upgrading (Chapter IV). It concludes that costs are not likely to constitute a binding constraint on textbook upgrading because textbook costs are reasonable and financially sustainable for the groups who bear them, students and the Government. The prevailing cost and financing formulas, which set textbook sales prices in relation to production costs, lead to a desirable sharing by students and the Government of the full costs of textbook production. Textbook purchases by students meet virtually all financial costs of textbook production and distribution, equivalent to just under half of the estimated real or total costs. Subsidies by the Government, both direct payments to publishers and paper manufacturers, and indirect subsidies as described in para. 4.33, account for the balance, estimated at 53% of total costs in 1985, a proportion that would be maintained under the proposed upgrading if the prevailing textbook pricing and cost formulas are retained in essentially their present form. While the mission finds the proposed upgrading program affordable, many issues remain to be resolved before the program can be successfully implemented. Recommendations are made in five key areas: (a) rationalizing textbook pricing and financing; (b) adopting an appropriate implementation pace for the program; (c) improving the educational effectiveness of textbooks; (d) assuring the effectiveness of the distribution system; and (e) meeting the human resource development requirements of the upgrading program. The chapter concludes with a discussion of setting priorities for investment.

Pricing Formulas and Financing

7. China's system for managing the financial aspects of textbook production and sale has worked well in the past because of the stability of prices and the availability of government subsidies. Under the present changing circumstances, existing pricing formulas may become increasingly unable to achieve their objective of assuring equitable cost recovery for textbook publishers. Therefore, the mission recommends that:

-- Pricing formulas should be reviewed now, and regularly in the future to assure their continuing suitability for achieving the Government's objectives (para. 4.23).

-- As new production standards are introduced, for example monochrome offset printing (which requires specially treated, more expensive, paper) the range of pricing formulas will need to be expanded.

Specifically, to ensure that the current degree of cost recovery is maintained under the proposed upgrading, the mission recommends that the existing textbook pricing and cost formulas be modified as follows:

-- The pricing formula for primary and secondary texts should be modified to eliminate the loss which publishers now incur in publishing monochrome primary and secondary texts (para. 4.8). If this were to take the form of an increased sales price equal to average publishing costs, additional measures should be adopted to permit cost recovery for individual textbook publishers whose costs are high for historical or geographic reasons rather than as a result of inefficient management (para. 4.14);

Issues concerning the financing of textbook distribution should be addressed:

-- The current formula for setting the fee received by Xinhua Shudian for textbook distribution, which is based on historical relationships, should be reevaluated to ensure that the fee paid for distribution of upgraded textbooks adequately meets the actual distribution costs, including interest payments, without generating excess profits for textbook distributors (para. 4.18).

While mission findings suggest that current sources of support to the poorest households are adequate to assure full textbook availability at present, additional sources may be necessary in the future, (para. 4.10). To meet that need:

-- The adequacy of support to poor households for textbook purchases should be kept under review as upgrading progresses. If additional forms of support are necessary, targeted subsidies should be considered as well as general subsidies.

8. The issue of book life (para. 3.4) has an impact on both pricing and financing of textbooks. The issue is of considerable consequence for lower levels of schooling because the projected production costs of upgraded books

are quite high, about 125% higher for books with color, about 110% for books with heavier paper and better covers, but no color (Table 4.3, para. 4.21).[1/] If texts were used for three years, for example, the total annual cost of improved textbooks would be less than for the present low-quality books and demands on the printing and distribution systems would be reduced because only one-third of all textbooks would have to be printed and distributed each year. On the other hand, shifting to multiple-year use would require some additional administrative tasks for schools and students and parents would have to forego book ownership.

9. A related issue is whether the Chinese should continue to design primary and secondary books to be used for only one semester, rather than for a full year. If texts continue to be sold to students, then twice yearly distribution is preferable in order to spread the printing task throughout the year and not overburden the distribution system. Changing to annual distribution would mean books would be printed throughout the year, and storage facilities at printing houses would have to be significantly increased. Also, because books would weigh at least twice as much (because they have content for a year instead of one semester), Xinhua Shudian would have to greatly increase both storage facilities and transportation capacity. On the other hand, if texts were used for several years, a shift to books covering material for an entire year could be made without strain on the system, and at some savings, since several expenditures, including the cost of covers, would be reduced. In light of the strong preference for student textbook ownership expressed by Chinese authorities, the mission recommends that:

-- The present system of selling primary and secondary textbooks to students should be retained, but experiments should be undertaken with multiyear use of some improved primary textbooks. If multiyear use is adopted for some texts, serious consideration should be given to producing texts covering the material for one year, instead of one semester (para. 3.4).

-- Second-hand book markets at universities should be strengthened, so that as book quality improves, texts no longer needed by students can be used by others, thus conserving resources (para. 3.4).

The Pace of Upgrading

10. As noted above (para. 5) the pace of implementation of textbook upgrading is likely to be constrained not by financial requirements of upgrading but by the availability of suitable quality paper, typesetting, printing and binding facilities, trained personnel and investment funds. Therefore, the program will have to be phased. The mission recommends that:

1/ It should be noted that the production quality of the upgraded textbooks will still be far short of the hard-bound, sturdy books used in most of the schools systems that reuse books.

-- For primary and secondary texts, upgrading should begin with primary texts in Chinese, science and mathematics for the early primary grades, which will be produced using color, and only later expand to include the remainder of texts for primary, and then secondary grades. The use of offset printing for monochrome books should be delayed until the first phase of the upgrading is complete.

-- For higher education, publishing houses and their associated printing houses should receive assistance in systematic fashion so that all the requirements for upgrading are put in place together and expensive machinery is used efficiently and productively.

11. Dramatic increases are projected in numbers of textbooks for higher education in the coming years (para. 3.12, Table 3.1). Title growth puts pressures on authorship, editorial resources, production resources, raw materials, and on publishing management and financial accountability. It is the impression of the mission that the consequences of the proposed title increases have not been examined in sufficient detail by the Chinese authorities. Therefore, specifically in regard to higher education, the mission recommends that:

-- Targeted increases in numbers of titles for higher education be reviewed to assure that they are realistic; a multi-year planning horizon be used in developing detailed estimates of requirements for raw materials and trained personnel; and measures be taken to assure that all the prerequisites needed to meet the targets, including supplies of paper, printing and binding capacity, and trained personnel are being strengthened or made available in an appropriate time frame.

Educational Effectiveness

12. The Chinese authorities have adopted several strategies to increase the educational effectiveness of textbooks. These include assisting authors to improve their knowledge of both substance and pedagogy; extensively field testing new texts; and increasing the variety of textbooks available, thereby providing education authorities with the means of addressing differences among regions and types of students. To strengthen and expand these initiatives, the mission recommends that:

-- Programs for assembling resource materials for textbook authors and increasing their availability, especially reference books and reports of research, should be strengthened (paras. 3.8, 3.16);

-- Methods for field testing textbooks should be improved and the schools selected as field test sites should represent the full range of kinds and quality of Chinese schools (para. 3.7); and

-- New programs to expand the number of approved texts for individual courses, at both lower and higher levels of schooling, should be pursued vigorously and procedures for approving alternative texts should be streamlined to allow for rapid implementation (paras. 3.12, 3.14).

Textbook Distribution

13. Changed standards of textbook quality and, for higher education, significant increases in the number of textbooks published, will strain the present resources and systems of Xinhua Shudian, the book wholesaling agency. The mission recommends that:

-- Subsidies for textbook distribution to remote areas should be reestablished (para. 3.27); and

-- Diversification of channels for distribution of higher education texts be encouraged (para. 3.19).

Human Resources

14. The textbook upgrading program will require large numbers of people with upgraded skills in authorship, editing, book design, field testing, typesetting, printing, binding, warehousing, financial management, production control, marketing and inventory control. The mission recommends that:

-- Institutions that provide training in publishing and printing on a national basis should be established or strengthened, to train both practitioners and trainers for on-the-job and institution-based training (paras. 3.28, 3.30); and

-- Selected key personnel should undertake training programs or be seconded to publishing houses overseas, to quickly bring knowledge of more advanced technologies and practices to China (para. 3.28).

I. INTRODUCTION

1.1 Research on education has shown that textbooks are crucial inputs to assuring high quality instruction in schools and to raising student achievement levels (Annex 5). Since the founding of the People's Republic, the Government of China has recognized the importance of textbooks and has endeavored to supply them to all students. The present system succeeds in providing a full set of inexpensive textbooks each year to all of the approximately 200 million students, at all levels of the education system. This requires the production, distribution and sale of about 2.6 billion textbooks annually. China's achievement in successfully supplying textbooks is indeed extraordinary.

1.2 Nevertheless, although the number of textbooks is adequate, Chinese educators recognize deficiencies in both content and production quality. The primary and secondary books now in use were prepared in the late 1970s, are commonly out-of-date and are considered inappropriate for the new stress on science and technology. Books for higher education suffer these deficiencies even more acutely. Almost all titles are printed on 52-gm letterpress paper, which is similar in quality to newsprint, and covered with paper scarcely heavier than the inside pages. Under classroom conditions, such books deteriorate quickly. Page size is small, about 13 by 18.5 cm, margins are narrow, and pages are crowded. The typical page has about 500 Chinese characters. Illustrations reproduce indistinctly on the lightweight paper and line drawings tend to be small and inadequately labeled and captioned. Books are bound with wire staples or side-stitching, which means they cannot lie flat when open. Only about 30% of the textbooks for higher education are published books; the remainder are manuscripts prepared for each institution and mimeographed and bound for sale to students. The production quality of mimeographed material is lower than that of the published books and, typically, the manuscripts have not been edited. Finally, at all levels, there is rarely more than one official textbook for each subject and grade, a degree of uniformity that is clearly inappropriate in a country as large and diverse as China.

1.3 In the light of these problems, the Chinese government has adopted ambitious plans to raise the quality of textbooks. Work has already begun on a new cycle of textbooks for primary and secondary levels, which will be ready for use in 1990. The proportion of published textbooks for higher education is expected to increase from 30 to 60% over the next decade. Further objectives are to increase the variety of textbooks available, both in methodological approach and in sophistication of treatment, to upgrade content levels and quality of authorship, and to significantly improve production and design quality of books by the use of better paper, larger format, more color, and better covers and binding, which in turn will require a substantial investment in the upgrading of typesetting, printing and paper provision. Chinese

authorities estimate that the proposed improvements in design would increase the cost of textbooks by 200%.

1.4 These plans raise many questions: Are the nature and the proposed pace of adoption of improved book production standards realistic given present shortages of paper and machinery? How should they be financed? How are costs and technological requirements for upgrading book quality affected by Chinese policies regarding book ownership and use? How will the present book production and supply system need to be modified to accommodate the proposed improvements? This paper explores these questions. Chapter II presents a brief overview of the context in which the textbook provision system is functioning: an education system striving to achieve universal basic (nine-year) education and at least double university enrollments by the year 2000, and economic reforms that are changing significantly the regulations and context under which the publishing industry operates, and provides a brief description of the scope and institutional framework within which the book provision system functions. Chapter III discusses problems with the existing system and presents China's plans for improvement and expansion. Chapter IV analyzes the costs of the existing system and explores the cost implications associated with the proposed improvements. Recommendations are presented in the summary to the report. Given the complexity of the textbook production system in China, a narrowing of focus is imperative. Thus, the report gives less attention to pedagogical issues, and makes no attempt to examine the contents of textbooks. Rather, it focuses on describing and assessing the Government's plans and exploring issues of costing, pricing, and technology. It finds the Government's plans justifiable and affordable, and identifies many of the problems and issues that must be addressed during implementation.

II. THE CONTEXT

Educational Reform and Expansion

2.1 Educational progress in China since the establishment of the People's Republic has been intermittent, with significant disruption occurring during the decade from 1966 to 1976. However, since the late 1970s, steady progress has been made in reorganizing and expanding the formal school system. In May 1985, in conjunction with the Seventh Five-Year Plan, China announced an education reform with five key aspects: (a) education is a key to "national quality;" (b) basic education (grades 1-9) is to become universal; (c) vocational and technical education will be developed vigorously; (d) at the tertiary level, enrollments will be increased, assignment of graduates will be improved, and colleges and universities will be given greater autonomy; and (e) leadership in education will be strengthened at all levels.

2.2 Universalization of basic education is to be accomplished in stages: in cities and coastal areas by 1990, in towns and villages with a medium level of development by 1995, and in the more backward areas, which account for about 25% of the population, at a rate commensurate with local conditions. Although under the reform, basic education would encompass nine years,

provinces have the freedom to adopt a five-year primary, four-year lower secondary plan, or a six-three plan, in effect allowing continuation of the dual system of five-year primary schools in rural areas and six-year schools in urban areas, which exists in much of China. Furthermore, poorer areas can progress towards nine years through a five-three system. This flexibility in the compulsory education law promulgated in 1986 ensures that, for the foreseeable future, China will have to continue to produce alternative series of texts for school cycles of different lengths.

2.3 Such a reform as is being undertaken in China would, under ordinary circumstances, be expected to result in an increase in enrollment. However, because of the highly successful effort at population control since 1979, total enrollment, which is dominated by primary enrollment, is projected to decrease between now and 1990 and then increase by 2000, but not to the levels of 1980 (Table 2.1). For the most part, gross enrollment ratios 1/ will increase. (The decrease predicted in the gross primary enrollment ratios for 1990 and 2000 reflect expected decreases in the proportion of overage students, from about 35% in 1985 to 0% in 2000.) Because of the demographic changes, only higher education will experience a substantial increase in the number of textbooks required but, because the number of students is relatively small, the increase will be a small percentage of overall requirements. As will be discussed in detail further on, the strains in the textbook provision system will come from increasing the number of titles available, and from efforts to improve book quality, rather than from an increase in the number of textbooks required.

1/ Gross enrollment ratio = number of people in school (of all ages) divided by the total number of people in the appropriate age group. The net enrollment ratio uses the same denominator, while the numerator is the number of people in school who are in the appropriate age group.

Table 2.1: ACTUAL AND PROJECTED ENROLLMENTS AND GROSS ENROLLMENT RATIOS ('000)

	Actual				Projected			
	1980		1985		1990		2000	
	Enrollment	Ratio	Enrollment (%)	Ratio	Enrollment (%)	Ratio	Enrollment (%)	Ratio (%)
Primary	146,300	95	133,700	107	122,400	96	125,000	94
Lower secondary	45,400	60	39,700	52	46,000	75	51,400	82
Upper secondary	11,400	17	7,400	16	20,000	29	29,000	56
Higher /a	1,100	2	2,700	4	4,400	4	7,600	11
Total	204,000		163,500		192,800		213,000	

/a Includes polytechnics.

Source: State Education Commission; World Bank projections.

The Policy Framework for Textbook Provision

2.4 Several key policies govern textbook provision in China at present:

(a) All students at all levels must have their own new copies of all required textbooks. Typically, schools and universities purchase texts and sell them to the students at the purchase price.

(b) Most textbooks cover course material for only one semester. Thus, two books per year are required for most subjects.

(c) The sales price of texts are to be set so as to recapture fully the production cost, and provide minimal returns to publishers.

(d) Textbook prices are to be kept as low as possible, to keep books affordable.

(e) Printing and distribution of textbooks are to be given priority over other printed materials, to assure that books arrive in schools by the beginning of each semester.

2.5 China has fulfilled these policy objectives, meeting the quantitative needs of the vast majority of students in school with commendable efficiency and consistency. This achievement has been possible through a publishing policy that, on the whole, restricts choice to one basic textbook per

subject per semester for the whole of China,[2] greatly simplifying the management of book production and distribution, and by keeping the quality, and hence the cost, of paper low.

Economic Reform

2.6 In October 1984, China announced a program of economic reform that called for rationalization of prices, increased enterprise financial accountability, a reduced role for mandatory planning, and adoption of new instruments of macroeconomic regulation. Some provisions of the program have been operational since 1985; implementation guidelines for others are being developed, in some cases through experimentation with alternative formulas. The main features of the new economic policy which affect enterprises involved in textbook publishing are the following:

(a) Prices and allocation of resources are gradually being freed from control by Government at various levels so as to begin to respond to market signals. Quotas and controlled prices will be retained for inputs to essential goods, including textbooks, but are to be eliminated for other categories of production. The main input to textbook production--paper--will continue to be provided at below-market prices. Mandatory planning is being replaced by guided, self-marketed production for other categories of goods, including general publishing.

(b) Enterprises are now to be held financially accountable, which means they are required to cover costs through receipts from sales.

(c) Enterprises will now be permitted to retain profits in excess of a stipulated profits tax, a move which is expected to serve as an incentive to improve enterprise performance. Unprofitable enterprises are subject to bankruptcy. Part of the retained profits can be used to pay bonuses to workers.

(d) Enterprises' capital requirements, which used to be provided on a grant basis from parent ministries, are progressively being met through enterprises' own financial resources--retained profits and loans.[3]

2.7 The new economic policies cause peculiar difficulties for textbook publishers, who face strong pressure to make a profit in a situation where some input prices are rising but textbook sales prices (but not the prices for reference and general books) remain fixed. The circumstances create an incentive for publishers to expand the more lucrative nontextbook publishing as a

---

2/ Actually two at the primary level because of the five-year and six-year systems.

3/ It continues to be Government policy to provide investment capital for educational publishers and printers for items in excess of 50,000 yuan.

means of generating development funds which textbook sales, by reason of price and profit restrictions, cannot create.

Textbook Publishing in China

2.8 Current Performance. The publishing industry in China is large by any standards; more than 6 billion books were sold in 1985 (Table 2.2). Educational books represent somewhat less than half of sales; in 1985, about 40% in number of copies, and about 30% in value of total book sales were for texts and other educational materials published for school use. Textbook production is given priority over all other publishing (including newspapers) so that generally speaking shortages of inputs experienced by the rapidly growing publishing field do not curtail the provision of school books.

Table 2.2: BOOK SALES: 1985

	No. of copies (billion)	%	Value (billion yuan)	% (book sales)
Primary/secondary level /a	2.41	40	0.864	27
Higher education /b	0.13	2	0.154	5
General books	3.56	58	2.197	68
Subtotal	6.10	100	3.215	100
Nonbook sales /c			0.135	
Total			3.350	

/a Includes texts and supplementary books.
/b Includes texts, reference and library books.
/c Includes records, tapes, educational hardware such as computers.

Source: Xinhua Shudian.

2.9 Table 2.3 provides a breakdown of textbook publishing by school level. As the table indicates, the number of titles is dominated by higher education; textbooks for universities and polytechnics account for about 80%. Book numbers are dominated by texts for primary and secondary levels, which constitute over 90% of the total. Texts for other types of schools constitute 10% of the titles and 3% of the copies.

Table 2.3: TEXTBOOK PROVISION: 1985

Type schooling	No. of titles	(of which new)	No. of copies (million)
Primary and lower secondary	351	(53)	2,259
Upper secondary	94	(18)	9
Teacher training	113	(13)	9
PRG schools	140	(34)	38
Polytechnics	828	(217)	43
Universities and colleges	2,446	(802)	79
Adult education	144	(54)	22
Total	4,116	(1,191)	2,459

Source: State Education Commission.

2.10 The average number of textbooks per primary and secondary student is thirteen, a number comparable to that found in developed countries. (In China each subject requires two texts per year, one for each semester. See Annex 1). At the tertiary level (college, university, polytechnic), students require about ten texts per year, but less than half this requirement can be filled by published texts. However, interviews with about a dozen universities suggest that all students do have instructional material for each course, the difference being made up by unpublished (mimeographed) books.

2.11 The Institutional Framework. Textbook production in China requires the participation of many agencies, at both the state and provincial levels (See Annex 1). The State Education Commission (SEdC) bears overall responsibility for the provision of textbooks. However, responsibility for individual contributions to the publishing process is shared by a number of entities within SEdC and several other agencies and ministries. Manuscripts are prepared by the People's Education Press (PEP), the Higher Education Publishing House (HEPH), university presses, and provincial education bureaus and publishing houses all under SEdC, and line ministry education publishing houses. The China National Publishing Administration plays a major role through agencies under its jurisdiction, including the China Printing Corporation, the China Printing Materials Corporation, and Xinhua Shudian, the state book wholesaling agency. Other ministries control allocation of raw materials and production capacity, subsidies and tax arrangements. The provinces, municipalities and autonomous regions [4/] have executive arrangements that, in many ways, mirror the central structures, and the national exercise to establish textbook printing requirements and to allocate the

4/ Hereafter referred to as provinces.

necessary typesetting, printing, binding and paper resources to meet them is based on agreements reached among provincial agencies that are similar to the national ones, including provincial education bureaus, publishing bureaus, and departments of finance.

2.12 SEdC plays a key role in textbook provision. SEdC comprises about 35 departments and offices, and seven enterprises and institutes. Six of the departments/offices and two enterprises (PEP and HEPH) are exclusively concerned with textbooks. Two offices of major importance have recently been reorganized. In September 1986 the National Evaluation Committee for Primary and Secondary School Textbooks (NECPSST) was established and the former Office for Primary and Secondary School Textbooks was designated the secretariat for the Evaluation Committee and renamed the Office for NECPSST. The Committee was established to separate compiling (manuscript preparation) from evaluation. Compiling remains PEP's responsibility, but this move permits other institutions or provincial offices to submit manuscripts for approval, thereby challenging PEP's domination of the field. Multiple adoptions[5/] will be allowed; SEdC hopes that the result will be a greater variety of school textbooks adapted to local or regional conditions.

2.13 At the higher education level, in October 1986 the Office of Teaching Materials, Library and Information Management was established by merging the former Offices of Liberal Arts Teaching Materials and Natural Science Teaching Materials, the Division of Publishing Management, and the Working Committee for University Libraries. The new office: (a) has major responsibility for overall planning and for overseeing the publishing of textbooks after they are compiled and evaluated; (b) recommends pricing and subsidy policies; and (c) administers the presses of universities run by SEdC. Direct jurisdiction over textbooks for basic courses published by HEPH rests with the second higher education department of SEdC (Chart 1). (These are called programmed books in China.) Textbooks for advanced courses are, for the most part, compiled and published by university and line ministry presses.

2.14 Several organizations have been established to support the development of educational materials. The Curriculum and Teaching Research Materials Institute was founded in 1983. It shares the same staff as PEP (240 researchers, writers, editors and administrators) and is responsible for research and development of teaching programs, syllabi, and teaching methodologies used in PEP textbooks. SEdC runs Imported Teaching Materials Centers, which are important resource centers for authors and editors. To date there are 13 centers located in major universities covering sciences, engineering, agriculture, medicine and foreign languages; three new centers are planned for liberal arts materials. The Centers house textbooks and other reference materials purchased overseas. HEPH has established a Center for the Exchange of Mimeographed Teaching Materials which serves as a repository for unpublished manuscripts (distributed within a university by mimeographing) which

---

5/ More than one approved text for a course, which provides a choice for the user.

are judged to be of good quality and hence are recommended for use by other universities teaching the same course.

2.15 Textbook (and other book) distribution is handled by Xinhua Shudian (XHS), the state book wholesaling agency run by the China National Publishing Administration. XHS, which is surely the largest book distribution chain in the world, maintains 8,500 retail outlets and supplies a further 100,000 book agencies throughout China. More than 200,000 people staff these operations. In China at present, virtually all textbook manufacture is undertaken according to yearly plans in which XHS plays a key role. Twice a year, XHS outlets in the teaching materials sections of the universities and colleges estimate their book requirements and pass them to six regional XHS distribution centers, which in turn pass them to the appropriate publishers. Publishers then print books against orders. For primary and secondary textbooks similar arrangements apply, but print runs are calculated and implemented at the provincial level in close association with provincial education bureaus. Several months later, when the books are ready, printers deliver them to XHS, which handles distribution.

2.16 To an outsider, the interrelationships between so many ministries, commissions and bureaus, at the state and provincial levels, seem unusually complex. Nevertheless, although shortcomings can be identified, the textbook provision system has worked quite well for many years. There is considerable staff continuity, and systems and procedures are clearly established and well understood. Communication between the center and the provinces is good and provides a satisfactory channel for the implementation of state directives. If the system were to remain unchanged, there is little doubt that it would continue to work effectively. However, changes are taking place, and they will accelerate in the future. In particular, the process of upgrading technology, which must be accomplished over a period of years, is going to require more intensive communication between ministries and bureaus responsible for allocating raw materials and production capacity. For example, a shift from letterpress to offset printing has ramifications that ripple through the system. The output from the factories producing printing presses must shift. Offset printing requires a different weight, quality, and size of paper, which in turn requires changes in the type of pulp used in paper manufacture, and changes in paper-making machinery. Maintenance of new kinds of machinery will require new skills, and so on. The pace of adoption of the new technology must be closely coordinated to avoid prematurely creating production capacity which will remain idle because of imbalances in the system.

III. CHINA'S PLANS FOR QUALITATIVE IMPROVEMENT

3.1 The Chinese government has set for itself the goal of improving the pedagogical and production quality of the textbooks used at all levels of schooling. This chapter examines the gaps that exist between the targets and the present situation. It first discusses the broad issues of improving textbooks, looking at primary and secondary texts first, then texts for higher education. Next, it examines the improvements in production technology and the new skills that will be required to accomplish the targeted upgrading. Finally, it assesses the implications of the increasing commercialization of textbook publishing for the upgrading program.

Improving Primary and Secondary Textbooks

3.2 By the year 2000, the China aims to improve primary and secondary textbooks in three respects: (a) to improve production quality, by increasing paper weight and page size of all texts, and adding color to the texts for Chinese, science and mathematics used in the lower primary grades; (b) to bring the content up to date and introduce more effective pedagogy into the presentation of material; and (c) to increase the variety of texts available, to meet the needs of different localities and students of differing capabilities.

3.3 Improving Production Standards. Chinese textbooks are printed in one color on low quality, lightweight paper. Such low quality paper makes it difficult to reproduce drawings and pictures adequately, a shortcoming that is particularly serious in textbooks for young children. Furthermore, research has shown that the use of color in textbooks improves the attractiveness of the books to young children and, at the lower primary grades, can have a significant effect on improving learning.[6/] The small page sizes used in China also impede good book design because of cramped layout of text. To remedy these shortcomings, the Government plans to increase the weight of paper used for primary and secondary books to 80 gsm, increase page size about 25% and introduce selective use of color. For the lower primary grades, mathematics texts would be printed in two colors, Chinese and science texts in four colors. These are standards adopted by all developed countries and also by developing countries like Mexico, that have recently undertaken system-wide improvements in textbooks. The mission believes that China's plans are fully justified. The major issues to be addressed in the Chinese context are the

---

6/ Judicious use of color has been shown to enhance instructional effectiveness by highlighting differences and clarifying illustrations, identifying salient information, and by motivating children and helping them retain information. Reviews of the literature can be found in: W. H. Levie and R. Lentz, Effectiveness of Text Illustrations: A Review of Research (Educational Communication and Technology Journal, 30, 1982) pp. 195-232 and D. M. Willow, D. Borwick, and M. Hayzren, The Contents of School Readers, eds. T. G. Waller, & G. E. MacKinnon (Reading Research: Advances in Theory and Practice, Volume 2, 1981, Academic Press).

cost of the improvements, and the pace at which they should be adopted. These issues are dealt with in Chapter 4.

3.4 Improving the production quality of textbooks raises the issue of the appropriateness of using books only once. Many other countries, both rich and poor, that produce sturdy textbooks have adopted systems which allow (or require) reuse of books. In some countries, texts are owned by schools and loaned or rented to students. An alternative strategy is to sell textbooks directly to students. When this is done, as in some countries at the primary and secondary level, and in most of the world at the university level, an active second-hand market develops, so that many texts are, in fact, reused. The issue of what is a suitable strategy for China must be examined in the light of Chinese circumstances. While economic rationality arguments may support multi-year use, such a change would be made at the cost of practices that are highly valued in China. In the Chinese view, student ownership of texts increases the effectiveness of instructional programs because: (a) receiving new texts serves as a stimulus to studying; (b) texts are needed in subsequent years to study for examinations, particularly language texts because of the large number of new characters that must be learned each year; and (c) students often make notes in books, as an aid to learning. Also, textbook ownership brings books into many homes that have few or none.

3.5 Upgrading Content. The pedagogical effectiveness of textbooks depends on both production quality and content. Instructional material should: (a) meet the learning objectives agreed to by the appropriate authorities; and (b) be at a difficulty level suitable to the background and experience of the students. Equally important, the material should be presented using instructional strategies that are congruent with the capabilities and educational level of the teachers. These objectives are achieved by using knowledgeable and well-trained authors, who continually incorporate into their work the results of research, and by using appropriate trial testing procedures.

3.6 In China today the preparation of primary and secondary texts is highly centralized. (During the Cultural Revolution (1966-76), responsibility for producing texts was decentralized to the provinces, with apparently an overall reduction in quality of books and reliability of delivery.) The process is as follows: PEP staff research, write and edit manuscripts on the basis of the syllabus and pedagogical guidelines laid down by the SEdC Departments of Primary and Secondary Education. A new manuscript is produced in a trial edition of about five to ten thousand copies. These are used for a full semester in specially designated schools, whose teachers provide feedback to PEP. The manuscript is then revised and passed to the Office of Primary and Secondary Textbook Compilation and Evaluation, which gives it to the relevant subject committee of the National Evaluation Committee (para. 2.12) for review. When the book is accepted (which may require some revision), it is ready for mass distribution.

3.7 Field testing of textbook manuscripts is common practice in China for primary and secondary texts. The procedure is usually begun on a small scale in a few classrooms in Beijing. After revision based on feedback from teachers, textbooks are used in a larger number of classes in both more and

less developed regions of the country. During the trial period, the texts are also reviewed by panels of experts, including subject matter specialists and teachers and school administrators. However, complaints about texts are often heard at the school level, for example that: (a) texts are too difficult or sophisticated for the students; (b) they contain too much material; (c) the content is inappropriate for or uninteresting to the students; and (d) explanations are not clear. Some of these difficulties are best addressed by having different texts for different localities. However, some shortcomings would be reduced by the use of more systematic and rigorous trialing procedures, and by taking particular care to trial books in typical, ordinary schools and not those that are "experimental" or otherwise advantaged. International experience has shown that achievement tests are not a useful tool for evaluating the effectiveness of textbooks, except under rigidly controlled conditions, and even then they do not provide the kind of detailed information that is most useful for guiding revision. For this purpose, detailed and systematic reporting of teacher experience is required, from classrooms chosen to adequately represent the diversity of the school population.

3.8 Textbook authors must be both subject experts and experts in pedagogy, and these areas of expertise must be continually refreshed, through exposure to the results of research undertaken in China and elsewhere. At the primary and secondary level, the Chinese have created an unusual setting for this continual upgrading, by assigning authorship and research functions to the same people (who are simultaneously staff of PEP and the Curriculum Teaching Materials Research Institute (para. 2.14)). It is more common, around the world, to separate these functions in order to avoid a tendency to narrow the research agenda to the immediate concerns and viewpoints of the authors. Others besides CTMRI staff carry out educational research relevant to the content and design of textbooks. All these Chinese researchers need upgrading in research methodology and exposure to research work being conducted overseas.

3.9 Increasing Variety. The overwhelming majority of textbooks for primary and secondary education are the "unified" books published by PEP. However, there are a few alternative sources. At a time when the rest of the nation had only five-year primary schools, and hence PEP produced only one text series, Shanghai and other areas adopted a six-year cycle. A consortium consisting of Beijing, Shanghai, Tianjin and the province of Zhejiang developed appropriate texts. Subsequently, PEP produced a six-year series. The two series, which are both available, are 90-95% the same, differing only in some presentational matters.

3.10 Ethnic minorities, comprising about 5% of the country's population, receive textbooks in their own language which are generally direct translations of the unified Chinese textbooks produced by PEP. This work is undertaken by provincial education bureaus and/or educational publishing houses, which also produce texts for learning Chinese as a second language and other books specific for minority populations. One province takes the lead for each minority language (of which there are more than a dozen used for instruction). For example, books in Mongolian are produced in Inner Mongolia and shipped to Xinjiang and other areas with significant Mongolian populations. Xinjiang, on the other hand, produces books in Uygur, Khazak and three other languages, which are supplied as needed to neighboring provinces.

3.11 Finally, experimental textbooks are developed by schools, teacher training colleges, or other agencies. After local trial, they can be certified by SEdC as experimental texts and purchased directly from the developer by other schools. For example, the Jingshan school in Beijing, a well known experimental school, has since its establishment in 1960 published 37 textbooks and nine teachers' reference books in algebra, Chinese language, calligraphy, computers, fine arts, music, sociology and craft. Many of these are purchased by other schools for their own use. SEdC information indicates that more than 60 such sets of course materials are under development, testing, or evaluation, but the volume of books involved is small, certainly less than a fraction of one percent.

3.12 On the whole, Chinese educators express much dissatisfaction with having only a single approved text series for the whole of China.[7/] Variety in texts is essential to meet the learning needs of students that differ in ability level and prior knowledge, and to reflect the cultural and geographical diversity existing in a country as large as China. SEdC agrees with the need for variety and is addressing the problem in two ways. First, under the reform, provinces are encouraged to develop supplementary materials in all subjects, designed to reflect local conditions and meet local needs. Second, a mechanism is being established to stimulate competition among authors and/or publishers and to allow multiple text adoptions at the national level. Publishing bureaus or schools will be invited to submit locally written and tested manuscripts to the National Evaluation Committee for review. All books accepted by the Committee will be authorized for use anywhere in the country. Many aspects of this new plan remain to be worked out. No decision has been made about the administrative level at which adoptions should be made. Counties or preferably prefectures would be the appropriate level: giving individual schools the power to adopt will put extreme strains on the book distribution system (para. 2.15), while a province is still too heterogeneous for a single adoption to be suitable. Another outstanding problem is how to decrease the time required to pilot test a book series before it is eligible for review by the Committee. The present procedures appear to require a decade for all local and provincial prerequisites to be met. Finally, guidelines for production quality for different types of books will have to be established, so that competition occurs within agreed cost parameters.

Improving Textbooks for Higher Education

3.13 There are five major sources of textbooks for higher education:

(a) "Programmed" texts, books for basic or core courses (those which comprise the first- and second-year course of study), which are adopted nationwide, are typically published by HEPH;

7/ The two series produced, for five- and six-year schools, are not significantly different in content or methodology.

(b) An increasing number of university presses publish nonprogrammed texts. (There were 66 university presses in June, 1986, 80 in November. The target is 100 by 1990.);

(c) Approximately 50 line ministry publishing houses publish textbooks in their specialized disciplines (Annex 1); and

(d) Most of the 29 provincial publishing houses publish textbooks for tertiary level institutions.[8/]

(e) Finally, large numbers of texts (about 70% of the total) are unpublished. These are provided locally at each college or university, usually through mimeographing staff lecture notes.

Publishing for higher education is a much more complex operation than for lower levels of schooling, because of the large numbers of titles and the relatively small print runs. The Government plans dramatic increases in the number of published titles for this subsector, from about 2,000 titles a year in 1985 to 6,500 in 1990, a 215% increase (Table 3.1). In addition to coping with increased numbers, the Chinese have identified four areas for improvement: (a) to increase the variety of titles available for individual courses; (b) to modernize the content of texts; (c) to improve the presentation of technical material; and (d) to diversify the system for distributing books.

8/ Reference and supplementary materials are published by both PEP and HEPH and by some other publishing houses as well. However, the number of these is small, and clearly inadequate for the level of educational quality towards which China is striving. Some key schools (schools with selected student bodies given priority in resources) have begun to use non-print materials, based on audio and video technologies, but these are not yet well developed in China.

Table 3.1: EXPANSION TARGETS: HIGHER EDUCATION

	1985 (actual)	1992	2000	% increase (1985-2000)
Number of titles				
New	2,645	7,000	10,000	275
Reprints	2,605	3,650	6,500	150
Total	5,250	10,650	16,500	215
Number of copies (million)	180	440	630	225
Typesetting requirement (million Chinese characters)	800	2,100	3,000	275
Paper usage (million reams)	2.2	4.4	8.2	275

Source: State Education Commission.

3.14 Increasing Variety. Providing texts with different difficulty levels and approaches is crucial for universities and colleges. Students studying in highly selective institutions will be better prepared, and able to handle more sophisticated material, than average students, and the texts for both groups should be appropriately designed. The content of basic courses, like mathematics or physics, that serve as prerequisites for advanced specialties, should reflect differing requirements of the specialties. This type of differentiation is not yet widespread in textbooks for higher education in China. Textbooks for higher education are written by subject specialists under several arrangements. The majority of manuscripts are prepared by professors for their own courses. Most of these are never formally published, but are mimeographed for distribution on a single campus. Each year a few manuscripts are selected for publication by university presses, or, on occasion, by HEPH. Approval of manuscripts before publication is managed by compiling committees, of which there are about 160 (Annex 1, Table 3). The committees comprise more than 5,000 university professors, many of whom are distinguished in their fields. In the early years[9/] the committee members themselves wrote the books. Now, when most manuscripts are written by other academics, the committees concentrate on evaluating manuscripts and providing guidance to authors. The compiling committees associated with HEPH and with the line ministries also commission manuscripts. Compiling committees can encourage increased variety and diversification in textbooks by adopting broad guidelines, rather than narrow syllabuses, for courses; by informing potential

9/ Beginning in 1960, after Russian influence decreased; prior to that time most university texts were translated Russian books.

authors that new approaches will be viewed favorably; and by demonstrating their commitment to diversity by their manuscript approvals.

3.15 In order to increase the number of manuscripts, SEdC has recently decreed that the provision of text materials is to be considered part of the job of every faculty member and furthermore, that formal publication (as opposed to producing mimeographed books) will be one requirement for promotion. Ironically, the Chinese authorities are putting in place the "publish or perish" philosophy which in the US and UK has been associated with an emphasis on quantity, sometimes at the cost of quality of publication. While it is useful to reward academic productivity, experience has shown that too much emphasis on publication can divert attention from teaching, which must remain the prime responsibility of university professors. SEdC also sees the need to provide authors with adequate remuneration and is already implementing ways to do this.[10/] While some success in increasing variety can be achieved through incentives to authors to publish, a major constraint is the shortage of typesetting and printing facilities. On average, there is a 12-24 month gap between approval of a manuscript and its date of publication.

3.16 Modernizing Content. Because of their long isolation, Chinese authors are out of touch with advances in subject matter and pedagogy generated in other countries, particularly in science and technology. Continued investment in intellectual resources--books, films, tapes--and in linguistic skills are needed to increase the rate at which new knowledge is incorporated into Chinese education in general, and textbooks in particular. At present there are 13 foreign reference book centers each specializing in a different subject area (para. 2.14), to service more than 100 publishing houses producing tertiary-level texts. These centers represent an important beginning in strengthening library resources available to authors, but much more needs to be done.

3.17 In planning for the future, most attention has been given to improving published books, and to shifting as fast as possible from mimeographed to published materials. However, given the size of the demand and the constraints to rapid expansion of production facilities, mimeographing is likely to play a significant role for many years to come. Thus, attention must be given to upgrading the quality of these materials. Establishment of the Center for the Exchange of Mimeographed Teaching Materials in SEdC is a step towards meeting this objective. The Center solicits from universities manuscripts that the universities judge to be of good quality. It prepares a catalogue of these as a means of informing other universities of their availability. Arrangements for payment and use are made directly between the universities. The Center needs considerable strengthening, both in its resources and in its systems for promoting exchange, before it can realize its

---

10/ As authorship becomes more profitable, the need for copyright laws will become more pressing. Existing law already prevents the unauthorized copying of material. A new copyright law which conforms to international standards has been drafted; Chinese authorities indicate that the law will be passed within the next few years.

potential for improving the quality of educational materials on college and university campuses throughout China.

3.18 Improving Presentation of Technical Material. In all societies, textbooks that present scientific or technical material rely heavily on diagrams, illustrations and photographs to convey content that is essential to learning. To be effective pedagogically, the graphic materials in such texts must be: (a) designed or chosen to high standards of clarity and instructional effectiveness; and (b) be printed on paper of sufficiently good quality so that the material is faithfully reproduced. Chinese textbooks fall short in both these respects.[11/] China plans to address the second problem by increasing paper weight to 60 gsm and shifting to offset printing. With good quality offset printing, the relatively small increase in paper weight should be sufficient to allow good graphics reproduction. Also, offset printing would bring with it larger page sizes, which would allow improved page design.[12/] Addressing the first problem, which has not yet been given high priority, requires adopting a more systematic approach to the selection and design of graphic materials. Diagrams and illustrations should be designed according to pedagogic principles that take into account the objectives of a course and student learning styles. Improving their quality will require training for Chinese authors, editors and illustrators.

3.19 Diversifying Distribution. At least two problems plague the distribution of textbooks for higher education. First, the tradition of mimeographing books on each campus has led to parochialism, so that many professors use their own manuscripts, in preference to books published by other universities that at least have the advantage of having been edited, and are generally of higher quality. But the system for distributing textbooks has also been an obstacle. For many years, Xinhua Shudian has been the only channel through which books were distributed in China. As noted earlier (Table 2.2), higher education books constitute only 5% of XHS's business, and university presses believe that XHS is not able to market their output energetically enough. Universities and colleges receive from XHS little more than the title, author and a very brief description of the books available, hardly enough to make an informed adoption decision. Recently, because of their dissatisfaction with XHS, and responding to the relaxation of previous controls, publishers in general have begun to establish their own retail shops, and university publishers are initiating their own mail order businesses. During 1986, discussion began about the possibility of establishing a consortium of univer-

---

11/ On occasion illustrations are printed on higher quality paper and inserted at the front or back of the book, but this is the exception rather than the rule.

12/ Reference is made on several occasions in the present paper to the circumstance that larger page format is a consequence of a shift to offset printing. This is true in China (but not necessarily elsewhere) because in China the standard offset presses require larger sized paper sheets than the letterpress machines.

sity presses that would market their own books, including textbooks, a development that may provide an important new channel for improved distribution.

Technological Upgrading

3.20 In China, manufacturing of textbooks for higher education is organized much as it is elsewhere in the world. That is, publishers contract with printing houses for typesetting, printing and binding.[13/] The system for primary and secondary texts is quite unusual. These are typeset by PEP, using lead type. Then, molds of the typeface, called paper matrices, are made in multiple copies for distribution throughout the country. Each paper matrix serves as a template for recreating the lead type for letterpress printing at the local printing house. The paper matrices, which can be used two or three times, are purchased by provinces from PEP as needed. (In 1985, PEP produced about 300,000 paper matrices).[14/] This decentralization of printing has two benefits: the enormous task of printing books in the millions is distributed around the country, and the difficulties of book distribution are reduced. This system functions well and is likely to remain in place to meet at least part of China's textbook printing requirements for the foreseeable future.

3.21 Improvement of textbooks will require significant technological upgrading of the printing industry. New, more sophisticated equipment will have to be acquired and people will have to learn to use the new equipment, to manage the more complicated production processes entailed, and to make more efficient use of machines, in order to justify the heavy capital investment. The paragraphs below examine the technological requirements of the modernization plans and the implications for training. Financial implications are examined in Chapter 4.

3.22 Upgrading Typesetting. At present, 90% of China's textbooks are typeset by hand. Because of the size of the character set (about 5,000 characters are used frequently), the task is tedious and slow. One typesetter can set about 8,000 Chinese characters a day; a typical higher education text with about 300,000 characters would take close to 40 person-days to set. Furthermore, lead type is bulky so that storage of set type between editions is not practical. Therefore, when revisions are made, entire books must be retypeset. Two other technologies are available, both of which are faster and allow storage of typeset text so that revisions can be made easily. Phototypesetting, which is currently used for 10% of textbook typesetting in China, is a medium-level technology that works much like a Chinese typewriter. Thus, for those who can type, relatively little additional training is required.

13/ Somewhat unusually, the publishers purchase paper for delivery to the printing house. This is disadvantageous because publishers cannot exercise direct oversight and printers have no incentive to store the paper carefully and to use it frugally.

14/ Paper matrices are satisfactory when printing by letterpress. For offset printing, film images of the typeface are required. PEP is now producing film for those provincial printing houses able to use it.

The second more advanced technology, laser typesetting, is computer based. Chinese characters are constructed by computer from input typed on a regular-size keyboard. (There are many different input schemes, some based on pinyin, a phonetic spelling of Chinese, others based on the strokes that make up Chinese characters.) Laser typesetters are: expensive, about US$500,000, as compared with US$35,000 for a phototypesetter; must be housed in an air-conditioned environment; and require extensive training to operate, and sophisticated skills to maintain and repair. The Government intends to shift to laser typesetting, which will certainly be the technology of choice for handling the Chinese language, with its thousands of characters. In the medium term, however, ordinary phototypesetting machines are likely to play the major role in mechanizing typesetting and probably only PEP and HEPH and perhaps the largest university printing houses should invest in laser technology.

3.23 Upgrading Printing. In China, 90% of textbook printing is by letterpress, the remainder by offset printing. Offset, the more modern technology, produces sharper print and much higher quality illustrations, but it requires different paper. The higher production standards envisioned by SEdC can only be obtained by shifting to offset printing. The major constraint to this shift is likely to be the availability of offset paper, which is not only heavier, but specially treated. Other issues raised by the upgrading plans are: (a) choosing between locally manufactured and imported equipment; (b) choosing the appropriate level of technology for different types of enterprises; and (c) deciding on which enterprises should have the capacity for specializations like color origination (preparing printing plates) and color printing.

3.24 Chinese printers interviewed during field work expressed a preference for imported printing equipment. Nevertheless, locally manufactured printing presses have several advantages. They are rugged and familiar, they make less use of electronics and pneumatics, so that they are easier to maintain, and they cost less than half the price of imported equipment. However, without significant expansion of the local machine building capacity, the demand for new offset printing presses for the proposed upgrading could not be satisfied. The output through mid-1988 of the largest offset printing machine building plant in China has already been consigned. Thus, any upgrading to offset printing to be made in the short term would have to be accomplished in part through the purchase of foreign manufactured equipment.

3.25 The question of what level of technology is appropriate for different types of enterprises is a related issue. The rule of thumb is - simple technology for short print runs, more sophisticated for longer print runs. Small offset presses, which are suitable for runs of a few thousand, print one side of the paper, and thus two passes through the machine are required for printing texts. For runs up to 50,000 black and white textbooks, modern printing plants customarily use "perfector" printing machines which are capable of printing both sides of the sheet with one passage through the machine. For longer print runs, further economy can be achieved from web offset printing machines, which not only print both sides of the sheet simultaneously, but also fold the sections as they complete the printing process. The choice among these options must be made on the basis of typical job sizes,

since using the more complex presses for small jobs is inefficient and uneconomical. Use of the more advanced presses should be reserved for print runs of large enough volume to generate adequate unit cost savings (para. 3.33) to repay the higher purchase and maintenance cost of the machines. Several university presses presented the field team with proposals to acquire equipment that was far more sophisticated than required for printing standard university texts. A similar situation exists with equipment for color origination and color printing, which is both expensive and, in many establishments, underused, yet appears on many lists of desired equipment. Chinese enterprises already own an estimated 280 color scanners, enough to service the country's color origination needs for some time to come. All but the largest printing houses should be required to purchase these services from printing houses that already have the requisite equipment.

3.26 Upgrading Mimeographing. Understandably, since the objective is to eliminate mimeographed materials, plans focus on published books. However, it will be many years before all higher education books are published. Even more seriously than published books, mimeographed materials suffer from having indistinct illustrations and fuzzy print. Because the ink spreads, frequently only one side of the paper is used, a wasteful (if necessary) procedure. Improving the quality of paper available for mimeographing and systematizing its allocation would be an important improvement. It would be useful if SEdC set a standard, for example 60 gsm paper, and if the China Printing Materials Corporation then allocated adequate quantities of this paper to universities for use in their mimeographing units. This would replace the present arrangement, in which universities purchase paper on the open market, and are often unable to obtain paper of adequate quality, and would permit using both sides of the paper, which would substantially cut costs. Several small-scale technological improvements should also be considered for producing "mimeographed" books. Use of electronic stencil makers would eliminate the need to retype stencils that wear out. Small offset presses may be an economically feasible technology for improving printing quality. Microcomputer software suitable for desktop publishing will soon be available and might be an affordable means of producing high quality original copy, which could then be mimeographed using electronic stencils or printed using a small offset press.

3.27 Improving Skills. The modernization plans will require new skills at every step of the process, from planning manuscripts to marketing and distributing books. At present, training for both publishing and printing are relatively scarce in China. A few universities run preservice courses in editorial training for editors of tertiary-level science and technology books. These are four- or five-year degree programs in a substantive specialty which include one- or two-years of training in editorial skills. Short inservice courses are run under the aegis of the China National Publishing Administration, through the recently established Scientific and Technical Publishing Committee. Some publishing houses, including HEPH, provide in-house training. Most of these courses suffer from the shortcoming that publishing has been narrowly construed, with editors playing the major

recognized role.[15/] As the nature of textbook publishing changes, a result of the drive to improve quality and open up competition, a whole new range of skills will be needed. These include book design and layout, market research, production management, publishing management, financial management, marketing, promotion and sales, and inventory control. As contact with overseas publishers grows, additional training on copyright and contracts will also be needed. Xinhua Shudian will also require more sophisticated management skills as it becomes more entrepreneurial in its operations, and as the number of titles it handles increases.

3.28 SEdC estimates that there are currently 1,700 editors in higher education presses. Typically they are subject specialists who have been recruited into publishing with little or no formal training. Another 1,000 editors will be required to accommodate expansion in higher education publishing. These, and at least 1,000 of those currently employed, will need training in editorial skills in the next five years. As a first step in designing the appropriate configuration for a new style of publishing training, a four-week seminar is being held in mid-1987 for key officials in educational publishing houses, with assistance from the United Kingdom. Plans are also being laid for establishing educational publishing training courses in several universities. In addition to expanding training within China, the government should continue its policy of sending key publishing staff overseas, to attend formal publishing courses, if possible designed specifically to meet the needs of Chinese participants, and on secondment to publishers in other countries. Firsthand exposure to other styles and methods of handling textbook publishing will strengthen the capacity of the Chinese to expand and change their system effectively.

3.29 Training in skills associated with book manufacture will also need to be greatly strengthened in the years to come. Reportedly, only about 1% of the personnel working in China's printing plants have had technical training. Most training is now provided through freestanding courses, some of them mounted to fill a short-term need and then disbanded. Recently a national institution, the Beijing Printing Institute, was established to provide systematic skill training. The Institute, which provides a four-year undergraduate course for secondary school graduates and two-year courses for those already working in the printing industry, draws students from the entire country. It is well placed to become a center for instruction in the use and maintenance of advanced technology, and for the training of instructors who could staff printing courses in provincial technical schools.

3.30 For the most part, todays' printers have learned their skills on the job. While machine operators appear to be quite competent, some printing plants visited during field work were not fully used, and resources, particularly paper, were being wasted. Training in production management is urgently needed, whether or not equipment is upgraded. In the future, the lack of

---

15/ Information provided by directors of two of the university editing courses indicate that these concentrate on Chinese language and history and basic reference and copy editing skills.

technical background of printing personnel is likely to become a significant constraint as the sophistication of printing equipment increases. Major new training efforts will be needed to meet the demand for skilled technicians able to use and service the new machinery that will be acquired. A lead role in this might be taken by the Beijing Printing Institute, but the growing demand will ultimately have to be satisfied by programs in provincial technical training institutes. Training trainers will necessarily have high priority in this process.

Commercializing Textbook Publishing

3.31 Textbook (and other book) publishing is undergoing far-reaching changes in China because of the continuing reform of regulations governing enterprise management and financing. For textbook publishing, two changes are crucial. The first is the requirement that publishers be self-supporting, even profit-making. The second is the introduction of diversity of book titles and competition among publishers. The changes are causing difficulties for publishers, some of which reflect inexperience with operating under a market system, particularly in dealing with risk and uncertainty. Other difficulties are imposed by the piecemeal nature of the changes that are being made in the system of textbook manufacture.

3.32 Under the system in place for many years, textbook production has been undertaken on an annual basis, according to plan (para. 2.15), with the prices of key inputs, labor costs, and book prices all controlled by the state. Textbook prices are set to recover costs, but such losses as occur have been subsidized by the state (para. 4.13 ff). In the recent reform, the Chinese authorities have retained most controls on prices of inputs and outputs (books), but have fixed the subsidies. Publishers seeking greater profits must do so either by increasing efficiency and cutting costs, or by diversifying into more profitable lines of business, or both.[16/] In this section we examine two important aspects of commercialization--managing book inventories and improving efficiency.

3.33 Creating and Managing Book Inventories. In China at present, the practice of maintaining book inventories (stocks) for multiyear sales is very limited, and such inventories as exist are kept by the distributor, Xinhua Shudian, rather than by publishers, as is customary elsewhere. In the textbook trade, inventories would be held to satisfy demand from individual purchasers and to realize economies of scale in printing.

16/ An exception to this occurred in 1986, when for political reasons the Government reduced prices of higher education textbooks well below cost, and guaranteed to provide a subsidy to publishers adequate to achieve a 5% profit (para. 4.8).

3.34 In the book publishing business, the unit cost of manufacturing a book varies inversely with the size of the print run, until a threshold is reached. Representative data from Beijing University Press illustrate the relationship, with costs decreasing markedly until run size reaches about 40,000 (See Annex 3, Table 5). For many higher education books annual sales are quite small, suggesting that manufacturing costs could be reduced by printing for several years and warehousing the extra copies until they are needed. Several obstacles stand in the way of institutionalizing such a procedure. The publisher or XHS must: (a) have capital to invest in inventory; (b) have adequate storage facilities; (c) be able to estimate future demand fairly accurately; and, finally, (d) determine whether it is financially advantageous to print for several years, taking into account storage costs, the cost of capital, the level of projected demand, and the risk associated with projected demand.

3.35 For most educational publishers in China, few of these requirements are yet in place. In particular, the source of financing is problematic. In principle, the investments in inventories, storage facilities, and working capital which are necessary to realize these potential scale economies, can be financed by retained earnings, by equity financing, or by debt financing. But few publishers are likely to have sufficient retained earnings for this purpose, and prospects for financing through the nascent equity market are very limited. Bank borrowing is thus the most promising form of financing for achieving scale economies of expanded print runs. Given the novelty of these practices, publishers will need guidance and encouragement in preparing loan proposals.

3.36 Improving Distribution. To date, China's textbook distribution system has functioned well. However, proposed changes will require adjustment in several respects: (a) coping with increased weight and numbers of books; (b) employing more sophisticated marketing arrangements; (c) supporting service to remote areas; and (d) prices and financing arrangements. The proposed improved production standards for primary and secondary texts (larger size and heavier paper) will increase the physical bulk of books by about 90%. Thus, as the upgrading is implemented, the physical burden for the XHS distribution system will increase to almost double, even without significant increases in the numbers of books. Without changes in book use policies, both storage and transportation facilities would have to be appropriately increased.[17/] Both expansion and diversification in titles will require better management of book inventories and more sophisticated marketing and financial management. XHS staff will need training in general and financial management, retailing, book promotion, warehousing, and computer operations.

17/ The mission observed more than a dozen book warehouses, all significantly underutilized because of the absence of racking. Installation of simple racking and a fork-lift truck would double capacity. With more sophisticated racking and high-stacking fork lifts, their capacity might be trebled.

3.37 The difficulty of delivering school books depends greatly on geography and population concentration. Before 1985, several sparsely populated provinces including Tibet, Xinjiang, Inner Mongolia, Qinghai, and Yunnan received subsidies from the national XHS in recognition of their distribution difficulties. These subsidies have been discontinued, apparently in conjunction with a dispute between XHS and SEdC about which organization should bear the extra costs, which are largely attributable to textbooks. The existing disparities between provinces in resources available for textbook distribution will increase as the upgrading program is implemented, increasing the necessity for determining the way that distribution in remote areas will be subsidized.

3.38 Increasing Efficiency. Opportunities for improving efficiency exist at every level of the textbook provision system. The mission has the following major recommendations in this regard:

(a) Avoid retypesetting. Many books are entirely retypeset after revision. This can be avoided by acquiring phototypesetting equipment and giving highest priority in its use to those books that are likely to need revision.

(b) Extend the life of equipment. The life of letterpress printing presses can be extended by using nylon or plastic plates in place of the current lead plates, thus reducing wear and tear on the machines, and by effective maintenance. Experimentation with nylon and plastic plates is already underway and should be pursued vigorously.

(c) Spread printing over longer time periods. Under present arrangements, in which textbook printing cannot begin until orders have been placed by Xinhua Shudian, production must be accomplished in the three to four months before the beginning of each semester. The peaks and valleys of textbook printing could be smoothed with better planning and phasing of book production.

(d) Increase machine run time. Many printing presses in China are operated for only one or two shifts a day, rather than three, as is customary in countries with highly efficient printing industries. Other ways of increasing run time include more efficient set up of jobs, and better machine maintenance.

(e) Avoid excessive inventories. Since publishers do not now hold book inventories, achieving appropriate sized book inventories in the future will require some experience and learning on their part. Also the relative roles of publishers and XHS in this regard will need to be clarified. Factors that will help both publishers and XHS increase sales include making sure books are of good quality, distributing better catalogues, using salesmen, increasing book outlets, and establishing more effective procedures for rapidly filling orders.

IV. COSTS OF TEXTBOOK PRODUCTION

Introduction

4.1 This chapter describes current and projected costs of textbook production under the proposed upgrading. It begins with a brief discussion of production cost concepts. Next, it describes the pricing formula for textbooks, discusses its limitations, and interprets textbook prices in relation to household income. It then discusses the input cost and supply provisions for textbook production and compares current textbook production costs with those in a market economy--Hong Kong. Next it projects the costs of textbook production under the proposed upgrading plans. It concludes with an interpretation of the cost projections relating to the financial feasibility of the proposed textbook improvements.

Cost Concepts

4.2 Costs of textbook production may be distinguished by the nature of costs (financial or real), or by who bears the costs (individual users, producers, SEdC, or the economy at large). This chapter to some extent deals with all these concepts of cost. Unit costs or average total costs of production for a given type of textbook will be used for much of our analysis of the feasibility and desirability of the proposed changes.[18/]

4.3 Financial costs of textbook production do not reflect the full cost to the Chinese economy insofar as financial costs (prices) of inputs differ from their real resource costs--i.e. their value in their best alternative use. In a market economy, variable input prices tend to reflect resource costs because competition for use of inputs by profit-maximizing producers tends to allocate resources to their most productive uses. In China, where controlled prices and mandatory resource allocation mean that prices play only a limited allocative role, financial costs of production are not a reliable indicator of true production costs. The main reason why the financial costs of textbook production are lower than resource costs is the artificially low prices of labor, energy, paper, and--historically--of capital. Wages are low,[19/] with very little variation to reflect productivity differences by region, sector, or skill level. Moreover, wages, bonuses and benefits paid by enterprises understate total labor remuneration because they exclude a number

---

18/ The Government's proposals for textbook changes are described in Chapter III.

19/ Annual wages in State-owned enterprises averaged Y 1,034 across all sectors in 1984, equal to US$280 at the exchange rate Y 3.7=US$1.00.

of benefits provided in kind.[20/] Electricity, the main form of energy used in textbook production, is priced about 50% below the prevailing price in other countries in the region. Plant and equipment needs for textbook manufacture used to be provided by parent ministries with no repayment obligation, although printers and publishers must now finance their own capital acquisitions through interest-bearing loans or through retained earnings. (University presses are an exception to this rule; their capital needs and some of their current costs continue to be met through university budgets.) Textbook publishers also benefit from preferential tax treatment equivalent to an average subsidy of about 35% of sales revenue.

4.4 The economic reforms described in Chapter II introduce corrections for some, but not all of the distortions that cause financial costs to differ from true resource costs. Moreover, their impact will be felt only gradually, as initially marginal changes come to affect a progressively larger share of production activities. Financial costs will thus remain below resource costs for the foreseeable future. Any direct estimate of the full difference between financial costs and resource costs of textbook publishing is clearly beyond the scope of this study. But we can approximate resource costs by adjusting financial costs of major inputs to textbook production to reflect known subsidies, and by comparing financial costs of textbook production to market costs of equivalent book production in Hong Kong. The results of these approximations are presented in paras. 4.21 and 4.22, below.

Textbook Prices

4.5 Textbooks at all levels of schooling are sold to students at controlled prices according to a formula imposed by the State Price Commission. For textbooks at all levels of schooling, the formula establishes a per-page price which varies by type of paper and type of printing (e.g., monochrome letterpress or multi-color offset). The basic price for standard (i.e., monochrome letterpress printing on 52 gsm paper) SEdC-sanctioned primary and general secondary school textbooks is .08 yuan per printed sheet (equal to 32 printed textbook pages of standard format), plus .04 yuan for covers. Thus, an average primary/secondary textbook of 112 pages sells for .32 yuan. Per-page prices for technical secondary and higher education textbooks range from .10 yuan to .20 yuan per printed sheet (Annex 3, Table 1). These higher prices reflect their smaller print runs and thus higher per-book origination costs (para. 4.16). Sales prices for supplementary books and reference books are also set by formula, and vary from .11 yuan to .23 yuan per printed sheet.

20/ Most conspicuous of these is housing. Employees pay rent for enterprise-provided housing, but at a very low rate which covers maintenance costs but does not cover amortization of initial construction costs. A recent analysis of labor subsidies estimates that non-wage subsidies for urban workers average 82% of nominal wages, and absorb 13% of national income. ("Subsidies", Nicholas R. Lardy, China Business Review, Nov, Dec. 1983).

4.6 For upgraded four-color textbooks, the textbook pricing formula sets a per-page sale price for primary and secondary textbooks of 0.24 yuan per printed sheet of 32 pages. Thus, a full-color primary or secondary textbook currently sells for about three times as much as a black and white version, a greater price differential then can be justified on the basis of financial cost differences (para. 4.9).

4.7 The State Price Commission's textbook pricing formula is intended to cover the full financial cost of textbook raw materials, manufacturing, and distribution, while keeping the sales prices to students as low as possible. It comes close to, but does not quite meet the first objective (considering only financial costs and ignoring implicit subsidies). The actual average financial cost of producing and distributing primary and secondary textbooks slightly exceeds the formula sales price,[21] thus necessitating a subsidy, paid to publishers by SEdC, to cover the balance between textbook sales receipts and production-distribution costs. A uniform subsidy of 3.2 yuan per 1000 printed sheets for black and white primary and secondary textbooks--equal to .013 yuan per book, or about 4% of the sales price of a textbook--is paid to publishing houses by the MOF provincial financial offices. Given the volume of textbook production, this implies that publishers received textbook subsidies of about Y 24 million in 1986.

4.8 The rate of the current subsidy was set by the MOF in 1985 so as to cover average textbook production costs. At that time, the textbook pricing formula stipulated a per-sheet price of .085 yuan for standard primary and secondary textbooks. Although the State Price Commission lowered the formula sales price to .080 yuan in 1986 (with no apparent change in production costs) the subsidy rate to publishers was not changed. As a result, publishers now lose money on every primary and secondary textbook they publish. The cost figures cited above indicate that the loss amounts to about 13 yuan per 1000 printed sheets in Beijing--which probably represents least-cost production--and about 39 yuan per 1000 printed sheets in Xinjiang--which is probably typical of the higher-cost provinces. Each textbook publisher must subsidize these losses with profits from other publishing activities. This is an undesirable situation, both because it represents inefficient resource allocation and because it poses a threat to future textbook publishing (since publishers, who are now expected to show an overall profit on their activities, are likely to be increasingly reluctant to publish textbooks under the prevailing price/subsidy formula).

4.9 Implementation of the proposed upgrading under the prevailing price/cost relationship would reduce the need for subsidization of primary and secondary textbook publishing, since prices for upgraded texts currently exceed their average financial cost by 0.16 yuan, or 17% of their sales

---

21/ Average financial costs of producing and distributing primary and secondary textbooks currently amount to .0804 yuan per printed sheet in Beijing, .08016 yuan in Jiangsu, and .0842 yuan in Xinjiang.

price.[22] Textbook upgrading, then, would help to relieve the current financial predicament of primary/secondary textbook publishers under the prevailing price/cost relationship. But the increased cost would be borne by purchasers of the upgraded textbooks--lower primary students and their families. Whether this is a financially feasible approach and a fair approach to primary/secondary textbook financing depends both upon families' capacity to pay and upon the desirability of full financial cost recovery through increased prices of the upgraded texts.

4.10 Most families can afford primary/secondary textbooks at current prices. A set of five textbooks, purchased twice each year, is likely to cost a student between 2 and 3 yuan a semester. This is just 1.2% of one month's income for an average urban household (equal to Y 205 in 1984), and 1.6% in rural areas (where average monthly household disposable income was 159 yuan in 1984).[23] Even in a poor province like Gansu, textbook purchases represent less than one half of one percent of average annual household disposable income. Moreover, various sources of support are available to the few students who cannot afford to buy textbooks.[24] These appear adequate to ensure full textbook availability.

4.11 In light of these figures on household income, it does appear that most primary and secondary students whose textbooks would be upgraded under the proposed reforms could afford to purchase the improved texts under the prevailing price formula. Even with the tripling of textbook prices which it implies, textbook purchases would amount to less than one percent of average annual household disposable income both in urban areas and in rural areas.

22/ The sales price for an average upgraded primary/secondary text is 0.92 yuan (equal to $\frac{112 \text{ pages per text}}{32 \text{ pages per sheet}}$ x 0.24 yuan per sheet + 0.08 yuan per cover). Financial cost for the same book is 0.76 yuan (Table 4.3).

23/ Stated otherwise, annual per-student expenditures on primary and secondary textbooks average 5 yuan, or twice the single semester amount. This is equivalent to just 0.2% of average annual household disposable income in urban areas (equal to 2,460 yuan in 1984), and 0.26% of average annual household disposable income in rural areas (equal to 1,908 yuan in 1984).

24/ Provincial education bureaus subsidize the production of multi-color textbooks for minority populations. Some schools have small factories or other income-earning activities, and use part of the income to purchase textbooks for students in need. The education component of the Gansu Provincial Development Project (FY 87) includes subsidies for textbook purchase in the poorest areas. Universities routinely subsidize the production of mimeograph texts and text supplements in order to keep prices to students low; these subsidies amount to an estimated Y 50 million per year.

4.12 The price formula for higher education textbooks is quite different from that for primary and secondary textbooks. In order to cover rising costs, sales prices for higher education textbooks were substantially increased in 1985. The price increase allowed most higher education publishers to recover costs, and generated significant profit for some publishers. It also provoked complaints from students and parents, leading to a decision by the State Pricing Commission to reduce prices by 20% in 1986. To protect higher education publishers from the financial consequences of this decision, the Ministry of Finance and SEdC together agreed to subsidize all higher education textbook publishers by whatever amount was necessary to yield a net profit of 5% on each publisher's operations. The total cost of these subsidies is not yet recorded, but an examination of accounts of HEPH and Beijing University Press suggests that subsidies will be required to cover publishing losses by HEPH for all titles, regardless of print run, whereas the university presses (which benefit from some subsidies through their university budgets) are able to cover costs for a few large print runs but lose money on most titles published.

4.13 Annual purchases of textbooks and mimeographed materials by university students average 20-25 yuan, equal to 0.9% of average annual household disposable income in urban areas, and 1.2% in rural areas in 1984. These purchases were widely reported to the mission as manageable for all but the poorest families. Given the relatively compressed distribution of household income in China,[25/] textbook purchase must constitute a hardship for only very few families or university students. For such families, sources of support such as those cited in para. 4.10 are available.

4.14 Because of the different bases of subsidization, the price/subsidy formula affects primary and secondary publishers differently from higher education publishers. For primary and secondary textbook publishers, the formula encourages efficiency because subsidies are based upon volume rather than costs. But it unfairly discriminates against those publishers who, through no fault of their own, experience higher costs. In the mission's experience, higher publishing costs in China often arise from an inherited situation of overstaffing or antiquated capital or from distance from sources of supply, rather than from inefficient enterprise management.

Current Textbook Production Costs

4.15 Like textbook prices, costs of most inputs to textbook production are controlled and supplies are assured according to a detailed annual plan. The control arises in the form of guidelines established by national and provincial publishing bureaus. Slight variations by province reflect differences in transport and other costs.

4.16 A breakdown of current financial costs of production for monochrome primary/secondary and higher education textbooks by major functional cate-

---

25/ In 1984, only 1% of households in urban areas had monthly incomes of 100 yuan or less.

gories of inputs is shown in Table 4.1.[26/] Differences between the two levels of texts in the magnitude of costs and in the allocation of costs among categories are evident in the table. The significantly higher share of printing costs for higher education textbooks reflects the much smaller print runs. Origination costs account for about 20% of higher education production costs whereas for primary and secondary books, with print runs in the millions of books, these costs are insignificant. Thus, economizing on origination would have a noticeable impact on unit production costs for higher education texts, but not for primary and secondary texts. The large differential in fees occurs because all authors of higher education books are paid for their work at a rate of 14 yuan per 1,000 Chinese characters, while only authors of locally written primary and secondary texts receive remuneration. Administration costs are currently calculated essentially on a per-page basis.

26/ The mission obtained data on production costs from several sources; the cost/pricing formulas established by central agencies were verified and supplemented through field interviews with numerous publishers, printers, distributors, and input suppliers. Reported costs were very consistent, although, as expected, there were slight regional variations for some cost categories. The unit cost figures inevitably include an arbitrary element in the form of assumptions as to the format and length of typical textbooks at each level. Averages provided by SEdC were used for this purpose. Hong Kong cost data were obtained by the consultants in the course of other work in the region.

Table 4.1: ESTIMATED BREAKDOWN OF UNIT FINANCIAL COSTS OF TEXTBOOK PRODUCTION: 1985
(Cost per 100 textbooks unless otherwise specified)

	Primary/Secondary /a		Higher Education /b	
	Yuan	%	Yuan	%
Paper	14.13	60	45.84	41
Printing	3.64	15	52.04 /c	46
Covers	3.57	15	3.57	3
Royalties/fees	0.26	2	4.49	4
Administration	1.92	8	6.82	6
Total	23.52	100	112.76	100
Production cost per book	0.235		1.13	
Average sales price	0.32		2.03	
Distribution cost /d	0.10		0.67	
Average cost per book (including distribution)	0.335		1.80	
Surplus (loss)	(0.015)		0.23	

/a Assumes 112 page book.
/b Assumes 416 page book.
/c Includes origination costs (typesetting and preparing illustrations) amounting to 24.4 yuan; origination costs for primary/secondary books are less than 0.5% of printing costs.
/d Distribution cost is 30% of sales price for primary/secondary, generally about 33% of sales price for higher education books.

Source: State Education Commission.

4.17 A major component of textbook production costs is paper. Paper accounts for 60% of costs for primary/secondary textbooks, versus 41% for higher education texts. The difference reflects economies of scale in book origination costs (but not paper) for the large-volume primary/secondary textbook print runs. Paper is allocated to publishers by the China Printing Materials Corporation. Paper for textbook production is sold by papermills at a controlled price which is as much as 30% below the uncontrolled price for general publishing (including the reference works and non-textbooks published by PEP, HEPH and the university presses.)

4.18 Textbook distribution costs are charged at a uniform percentage of the formula-set textbook sales price, regardless of destination and weight of books. The distribution fee is paid by publishers to the distributor, Xinhua Shudian, when the latter picks up books for delivery. XHS thus bears the financial burden of textbook inventories for the two-to-three month period between taking delivery of books from publishers and receipt of payment for

book sales to students. (In 1985, interest charges for XHS, largely attributable to financing inventory, amounted to Y 42 million, about 10% of operating expenses). Distribution represents a significantly higher proportion of costs for higher education textbooks than for primary/secondary textbooks because: (a) in 1985, primary and secondary books sold below, and higher education books sold above production costs; and (b) the rate charged is different, 30% of sales price for primary and secondary, 33% of sales price for higher education texts on average.[27] The higher rate is intended to reflect the higher unit cost to XHS of handling smaller numbers of books.

4.19 In interpreting the figures in Table 4.1, it is important to recall that these figures reflect the structure of financial costs of textbook publishing as of 1985, before the full effect of the recently-initiated economic reforms. Notably absent from them is the cost of amortization of existing capital. In the future, the share of printing costs for primary/secondary textbooks is likely to rise as purchase and amortization costs for new printing equipment begin to be reflected in printers' and publishers' accounts. Administration costs are also likely to rise as publishers begin to assume financial responsibility under the economic reforms for their own staff housing and other construction needs. Because university presses will apparently continue to benefit from university budget resources for all of their capital needs and some of their recurrent needs, their costs are likely to rise less than those of primary/secondary textbook publishers.

4.20 It is also important to recall that Table 4.1 describes the current situation, which is dominated by monochrome, letterpress printing of textbooks. The following section presents estimates of how the proposed qualitative improvements in textbooks would affect production costs. Before concluding this section on current production costs, however, we consider briefly the relationship between these financial costs of textbook production, and their resource cost to the Chinese economy.

4.21 Applied to current textbook production volumes, the unit financial cost figures presented in Table 4.1 imply annual expenditures of Y 757 million for primary and secondary textbooks, and Y 324 million for higher education textbooks. Together, these equal less than 6% of total government recurrent expenditures on education (equal to Y 18.4 billion in 1985.) They also represent a per capita national expenditure of just one yuan. Adjusting the figures of Table 4.1 to include subsidies for electricity and tax exemption raises unit costs and total costs by 55% above financial costs for primary and secondary education, and by 24% above financial costs for higher education. These adjustments provide a first approximation of resource costs of current textbook production.

4.22 A better approximation is available through a comparison with the costs of producing equivalent textbooks in Hong Kong, whose cost structure

---

27/ Distribution costs depend on the method employed. University presses charge 5-10% for direct mail sales. Diversification of distribution methods (para. 3.19) will bring further changes.

provides a better reflection of resource costs than China's. Table 4.2 compares the costs of producing textbooks of equivalent standards in China and Hong Kong, based upon actual costs of major publishing inputs under current production standards.[28/] It is apparent in Table 4.2 that the overall cost of producing primary/secondary textbooks in Hong Kong is 138% higher than in China; higher education textbooks are one-half more costly. The large cost differential for covers reflects the higher cost of mechanized binding in Hong Kong. The 200% printing cost differential for primary/secondary textbooks is largely attributable to three factors: the absence of capital amortization expenses, the artificially low electricity charges and the large volume print runs in China. Paper and printing costs for higher education textbooks are about one-third higher in Hong Kong than in China. The apparent reason why printing costs differ less than for primary/secondary textbooks is that the smaller volume of print runs raises the relative importance of typesetting costs and lowers the relative importance of printing costs per se.

Table 4.2: COMPARISON OF CHINESE AND HONG KONG TEXTBOOK PRODUCTION COSTS UNDER CURRENT PRODUCTION STANDARDS
(Cost per 100 books, unless otherwise stated)

	Primary/Secondary			Higher Education		
	China (Yuan)	Hong Kong (Yuan /b)	Ratio:Hong Kong/China	China (Yuan)	Hong Kong (Yuan) /b	Ratio:Hong Kong/China
Paper	14.13	16.40	1.16	45.84	60.91	1.32
Printing	3.64	11.06	3.04	52.04	70.32	1.35
Covers	3.57	27.21	7.62	3.57	27.21	7.62
Other production costs /a	2.18	2.18	1.00	11.31	11.31	1.00
Overall cost per book	0.24	0.57	2.38	1.13	1.70	1.50

/a Royalties, fees and administration. Hong Kong costs for these categories are assumed equal to Chinese unit costs (from Table 4.1).
/b Evaluated at HK$2.00 = Y 1.00.

Source: State Education Commission, Mission estimates.

28/ Unit production costs for royalties, fees and administration in Hong Kong--which were not available to the mission--are assumed to be the same as in China. This synthetic approach to cost comparison is followed because Hong Kong does not produce textbooks of equivalent production standards to those in China, thus precluding a direct comparison of sales prices of textbooks.

Costs of the Proposed Improvements

4.23 Using the same cost components as Table 4.1, Table 4.3 presents estimated unit recurrent costs of the individual qualitative improvements proposed for primary/secondary and higher education textbooks. (Capital costs of the improvements are dealt with in para. 4.27 below). Table 4.3 also shows the cumulative recurrent cost of the proposed program of qualitative improvements, consisting of the sum of the augmented costs for each component. Costs in all cases are presented as financial costs of production and distribution according to the input price formulas prevailing in November 1986.

Table 4.3: UNIT RECURRENT COST OF IMPROVED TEXTBOOKS, FULL UPGRADING AS PER GOVERNMENT PROPOSAL (1986 PRICES)

	Primary/Secondary			Higher Education		
	Improvement	Cost per 100 books (Yuan)	Cost ratio: Improved/ basic /a	Improvement	Cost per 100 books (Yuan)	Cost ratio: Improved/ basic /a
Paper	Increase size to offset format weight to 80 gsm improve quality	30.76	2.18	Increase size to offset format, weight to 60 gsm, improve quality	74.91	1.63
Printing	Upgrade to offset process, 4 color /b	8.54	2.35	Upgrade to offset process, 1 color	52.04 /c	1.00
Covers	Upgrade to 150 gsm 4 colors, laminated	11.21	3.14	Upgrade to 150 gsm, 2 colors, laminated	10.38	2.91
Admin/ royalties	None	2.18	1.00	None	11.31	1.00
Total		52.69	2.24		148.64	1.32
Production cost per book		0.53	2.24		1.49	1.32
Full cost per book (including distribution)		0.76	2.27		2.22	1.23

/a Basic costs represent current monochrome printing technology, given in Table 4.1.

/b Proposed for first three primary grades, in science, mathematics, and language only. All other primary/secondary textbooks would adopt monochrome offset printing in larger formats. Costs for these other textbooks would be the same as for the fully upgraded texts in all categories but printing, which would remain the same as in the basis case.

/c Same unit recurrent cost as basic existing technology of letterpress printing.

Source: State Education Commission.

4.24 As the proposed qualitative improvements focus on primary and secondary textbooks, it is at that level that cost increases are most apparent. Production costs would more than double for improved primary and secondary textbooks, reflecting unit cost increases of more than 100% over current costs for paper, printing and book covers. Production costs of an average primary/secondary textbook would rise from the current level of 0.24 yuan to 0.53 yuan for textbooks upgraded to four-color printing (amounting to about one-quarter of primary/secondary texts). The production costs of other primary/secondary textbooks, which would be upgraded in size and quality of paper but would retain black and white printing, would increase to 0.48 yuan. Total costs of an average primary/secondary textbook, including distribution, would rise from 0.34 yuan to 0.76 yuan for a four-color textbook, and to 0.71 yuan for an upgraded monochrome textbook. For higher education, where the improvements would focus on improved legibility and durability of textbooks, average production costs would increase by 32%, from 1.13 yuan to 1.49 yuan.

4.25 In order to translate these unit recurrent cost increases into total recurrent costs, we multiply by projected increases in the number of textbooks at each level. Table 4.4 presents the results of this exercise. For primary and secondary schooling, the prospect of stationary enrollments (Annex 2, Table 2) leads to a very modest increase in the projected number of textbooks--by just 11% from 1985 to 2000. Combined with the total unit cost increases described above of 124% for color books and 109% for black and white books, that implies an increase in total costs of primary/secondary textbook production and distribution from Y 757 million to Y 1,810 million. For higher education the Government's proposal to diversify university textbooks and progressively replace mimeographed lecture notes with published textbooks, as well as a more than doubling of university enrollment (Table 2.1), leads to a very large projected increase of 250% in the number of textbooks from 1985 to 2000. This implies that total costs for university textbooks would increase by a factor of 4.3. Aggregated over both levels, full implementation of the Government's proposal for qualitative improvements in a situation of growing enrollments and diversification of higher education textbook titles would raise recurrent costs of textbook production almost threefold--from Y 1,081 million in 1985 to Y 3,209 million in 2000. This implies that the full upgrading as per the Government's proposal would raise total recurrent costs of textbook production in the year 2000 by 63% above what they would be in the absence of any upgrading.

Table 4.4: PROJECTED IMPACT OF TEXTBOOK UPGRADING ON TOTAL RECURRENT COST OF TEXTBOOKS/a

	Primary and Secondary		Higher Education		Total	
	1985	2000	1985	2000	1985	2000
Number of Textbooks (millions)	2,260	2,506	180	630/b	2,440	3,136
Cost (Y million):						
1985 Production Standards	757	840	324	1,134	1,081	1,974
Full Upgrading /c		1,810		1,399		3,209
(Government Proposal) /d						
Intermediate Upgrading Option		1,115		1,399		2,514
Ratio: Projected Cost with Upgrading / Projected Cost without Upgrading						
Full Upgrading		2.15		1.23		1.63
Intermediate Upgrading Option		1.33		1.23		1.27

/a In millions of 1985 yuan.

/b Accommodates both increase in number of titles and increase in student population. See Table 2.1 for enrollment projections.

/c All primary textbooks upgraded to 80 gsm paper, offset printing. Some lower primary books printed in color: mathematics (2 colors), science and language (4 colors). Assumes these comprise 25% of total. All higher education books upgraded to 60 gsm paper, offset printing, one color. Total paper requirment in 2000: 8.5 million reams of 80 gsm offset paper, 7.7 million reams of 60 gsm offset paper.

/d Primary secondary textbook upgrading limited to those texts which would be improved to four-color printing, with the remaining 75% of primary/secondary textbooks retaining current monochrome letterpress technology. Higher education upgrading as per government proposal.

Source: Mission estimates.

4.26 Table 4.4. also shows the projected recurrent cost of an intermediate option for textbook upgrading which reflects the impact of phased implementation in the form of initially limiting primary/secondary upgrading to those textbooks - science, math, and language in the first three grades of primary school - which would be upgraded to color printing under the Government's proposal and would hence require the change to heavier, offset paper. The remaining three-fourths of primary/secondary textbooks which were not planned for color printing would temporarily continue with monochrome letterpress printing on 52 gsm paper (rather than adopting monochrome offset printing on heavier paper) until all the requirements of full upgrading were met. Higher education textbooks would be upgraded as per the Government's

proposal. This intermediate option would assure that all primary school students start school with the educational advantage of improved, multicolor textbooks although it would also defer planned improvements in textbook production quality for grades 4 through 12. Under this option, total textbook recurrent costs in the year 2000 would increase to Y 2,514 million, or by just 27% over the projected increase in textbook costs with no upgrading.

4.27 Cumulative capital requirements to implement the proposed full upgrading of primary/secondary and higher education textbooks by the year 2000, totalling Y 1.1 billion in estimated value at 1985 prices, are presented in Annex 3, Tables 3 and 4. Capital requirements for the intermediate upgrading option would be about one-third less, totalling about Y 750 million. Assuming that annual new capital purchases for either upgrading option would amount to about 10% of these respective totals, annual capital requirements are estimated at Y 110 million for the full upgrading, and Y 75 million for the intermediate option.[29/] In either case, new capital outlays for textbook upgrading would not exceed 3½% of estimated recurrent costs of textbooks in the year 2000. Recovery of these capital costs through textbook sales could be achieved through a slight adjustment in the price formulas for primary/secondary and higher education textbooks.

4.28 The figures presented above describe the current and capital financial costs of upgrading textbooks. To estimate the real costs of textbook upgrading, we return to the Hong Kong input cost comparison. Table 4.5 provides the cost comparison for the full and the intermediate upgrading, using the same cost categories as Table 4.2:

29/ This figure does not include replacement costs for fully depreciated existing capital stock, for which no reliable estimates are available. In the mission's experience, however, very little printing equipment is retired each year. Typically, antiquated letterpress machinery is maintained in productive use well beyond its normal life.

Table 4.5: COMPARISON OF CHINESE AND HONG KONG TEXTBOOK PRODUCTION COSTS UNDER FULL AND INTERMEDIATE UPGRADING OPTIONS
(Cost per 100 books, unless otherwise stated)

	Primary/Secondary			Higher Education		
	China (Yuan)	Hong Kong (Yuan /b)	Ratio:Hong Kong/China	China (Yuan)	Hong Kong (Yuan) /b	Ratio:Hong Kong/China
Full Upgrading /a						
Paper	30.8	41.8	1.36	74.9	116.4	1.55
Printing	8.5	26.0	2.06	52.0	70.3	1.35
Covers	11.2	38.8	3.46	10.4	38.8	3.73
Other Production Costs /b	2.2	2.2	1.00	11.3	17.5	1.54
Total	52.7	108.8	2.06	148.6	243.0	1.64
Production Cost per Book	0.53	1.09	2.06	1.49	2.43	2.43
Intermediate Option /c						
Paper	18.4	22.8	1.24	74.9	116.4	1.55
Printing	4.9	14.8	3.02	52.0	70.3	1.35
Covers	5.5	30.1	5.47	10.4	38.8	3.73
Other Production Costs /b	2.2	2.2	1.00	11.3	17.5	1.54
Total	31.0	69.9	2.25	148.6	243.0	1.64
Production Cost per Book	0.31	0.70	2.25	1.49	2.43	2.43

/a As per government proposal.
/b Royalties, fees, and administration. Hong Kong costs for these categories assumed equal to Chinese costs.
/c As described in para. 4.26. For primary/secondary equals 25% of full upgrading costs and 75% of basic costs as in Table 4.2. For higher education equals full upgrading cost.

Source: Mission estimates.

Estimated real costs of primary/secondary textbook production (using the Hong Kong cost proxy) are more than twice as high as projected financial costs under both upgrading options, but the real/financial differential is less than in the present situation (Table 4.2) because upgrading would lead to a relative decline in use of the most heavily subsidized inputs. The reverse is true for higher education, where estimated subsidies would rise from 50% of financial costs currently to 64% under the proposed upgrading.

4.29 Table 4.6 provides a summary estimate of the total cost of upgraded textbook production and distribution in the year 2000, based on the information presented above. Financial costs are projected to grow at 4.0% per year between 1985 and 2000 in the absence of upgrading, and at 5.8% and 7.5% respectively under the two upgrading options. Real costs are projected to grow slightly more rapidly than financial costs under the two upgrading options because of the implicit shift toward inputs embodying greater indirect subsidies in higher education.

Table 4.6: SUMMARY ESTIMATE OF COSTS OF TEXTBOOK UPGRADING ACCORDING TO TWO UPGRADING OPTIONS; ANNUAL COSTS BY COST CATEGORY IN MILLIONS OF 1985 YUAN
(annual growth rates in parentheses)

Cost Category	1985 Base Year	Projected (2000) No Upgrading	Intermediate Upgrading Option	Full Upgrading Government Proposal
Financial				
Recurrent /a	1,081	1,974 (4.0%)	2,514 (5.6%)	3,209 (7.3%)
Capital /b	-	-	75	110
Total	1,081	1,974 (4.0%)	2,589 (5.8%)	3,319 (7.5%)
Real /c	2,288	3,700 (3.2%)	5,983 (6.4%)	7,238 (7.7%)

/a From Table 4.4.
/b As described in para. 4.27.
/c Equal to Table 4.2 and Table 4.5 ratios applied to recurrent cost totals from Table 4.4, plus capital costs from row 2.

Source: Mission estimates.

Financing of Textbook Improvements

4.30 The preceding sections have estimated the costs of the proposed textbook upgrading, and have examined the impact upon individual purchasers of textbooks under the prevailing price formula. In light of these costs, is the proposed upgrading financially feasible? If so, what would be an appropriate formula for cost-sharing by textbook users and the Government? This section attempts to answer these questions.

4.31 Since the financial costs of textbook production and distribution are almost entirely recovered through student purchases, the pertinent financing question is whether students' families can afford the increased cost of

the proposed upgrading. The information presented above on average student purchases of textbooks in relation to household income indicates that these purchases are not an unreasonable burden for the vast majority of families - a finding which was confirmed to the mission by students, parents, and education administrators. This participation by students in textbook financing is a very positive and unusual feature of education financing in China, and should be retained under any upgrading. The proposed upgrading would raise annual per-student textbook purchases for primary and secondary schooling from the current level of 5 yuan per year to about 15 yuan under the current price formula, and to just over 11 yuan if the formula were adjusted to reflect actual production costs (para. 4.9). In light of the household income information presented in para. 4.10, above, it appears that the vast majority of households could afford the textbook price increase implied by the upgrading.

4.32 The Government's proposal to upgrade higher education textbooks to offset printing would not affect textbook prices under the current pricing formula (para. 4.5 and Annex 3, Table 1), because textbooks would retain monochrome printing. If the price formula for higher education textbooks were to be changed to reflect the production cost differential for the proposed upgrading, the price of an individual textbook would increase by 32%.[30/] Per-student expenditures on textbooks would increase by a similar amount - from an estimated level of 11 yuan per semester to about 15 yuan per semester; any increase in average number of textbooks per student would tend to be offset by reduced expenditures on mimeographed materials. An increase of this magnitude in family outlays for higher education textbooks does not appear burdensome in light of average household income and expenditure information. Higher education textbook outlays of 30 yuan per year would amount to just 1.2% of average annual household disposable income in urban areas and 1.6% in rural areas.[31/]

4.33 The most visible element of costs for textbook production is financial costs, which are largely recovered through textbook sales to students. More relevant to the Government's decisions relating to textbook upgrading are the costs which it finances through direct and indirect subsidies. Direct subsidies[32/] include: (a) those paid to primary/secondary publishers to cover the small average per-volume loss, estimated at a total of Y 24 million in 1986 (para. 4.7); (b) subsidies paid to publishers of higher education textbooks to yield a 5% operating profit; and (c) subsidies in the form of university outlays to underwrite the cost of mimeograph texts, estimated at Y 50 million per year (para. 4.10). Far more important are indirect subsidies,

---

30/ Based on the unit cost estimates presented in Table 4.3.

31/ Based on the 1984 data cited in para. 4.10.

32/ Direct subsidies are not shown in Table 4.6 because there is no objective basis for projecting how they would change under the proposed upgrading. They are, in any case, small in relation to the costs included in Table 4.6.

defined here as the difference between financial costs and estimated real costs. Indirect subsidies are projected to grow from Y 1.2 billion in 1985 to Y 3.4 billion under the intermediate upgrading option and to Y 3.9 billion under the full upgrading. This implies an average annual rate of growth in indirect subsidies of 6.9% under the intermediate option, and 7.9% in the case of full upgrading.

4.34 These resource cost estimates are presented in order to give some indication of the extent of public support for textbook production. Because of the pervasive external effects of education which benefit society as a whole, it is appropriate that the Government subsidize to some extent the provision of essential education inputs, including textbooks. Because the external benefits of education cannot be satisfactorily quantified, it is not possible to stipulate an ideal formula for public and private participation in financing educational inputs. But the estimates of real costs and financial costs of textbook upgrading as presented above appear both reasonable, and feasible in financial terms. Indirect subsidies for textbook production, as estimated above, amounted to 6.5% of government-financed recurrent expenditures on education in 1985. Moreover, the projected growth of these expenditures under either upgrading option is well below the 11.3% average growth of constant-yuan expenditures on education during the period 1980-1985. If this cadence of education expenditure growth is maintained, government outlays on textbooks in both real and financial terms would decline as a share of total education expenditures.

4.35 The requirement for direct subsidies could increase in the future if input price controls were eased, particularly for paper. As Table 4.5 shows, paper requirements for textbooks upgrading are priced at an (unweighted) average of 45% higher in Hong Kong than in China. Moreover, non-quota paper prices in China are as much as 30% above quota prices for textbook production. If the cost of paper for textbook publishing were raised to the non-quota price, direct subsidy payments by the Government would need to rise by 800 million yuan per year under the upgrading, or the sale price to students would need to rise by an additional 16%. If the cost of paper were raised to equivalence with Hong Kong prices, it would increase government subsidies by 1,300 million yuan or textbook sales prices by 25%.

Setting Priorities for Investment

4.36 The upgrading program will require strengthening of organizations at both the central and provincial levels, through training, technical assistance and the provision of equipment. Because the program must be phased, decisions will have to be made about how to set priorities. The mission recommends that three general principles should be followed: (a) investment needs of agencies and facilities that serve the entire country should be addressed early in the program; (b) for primary and secondary texts, publishers and printing houses in the most disadvantaged provinces should be given priority; and (c) for higher education, strong university and line ministry publishing houses should be given priority. The rationale for these three principles and their application in practice are discussed in the following paragraphs.

4.37 The rationale for supporting national institutions early is clear: these institutions serve the entire country and thus their improvement yields benefits in the form of qualitative improvements on a national scale. The two most important institutions are PEP and HEPH, both of which will need: (a) expanded intellectual resources, in the form of books, journals, study visits, staff training, and visiting experts; (b) computers and other equipment required for information storage and use; and (c) equipment for their associated printing houses. Two other important national institutions requiring assistance are the Beijing Printing Institute (para. 3.29) and the newly established publishing institute (para. 3.28), both of which should be serving as key training institutions for the sets of skills required for modern textbook publishing, training not only professionals for enterprises, but potential trainers as well. Both of these institutions will be expanding and upgrading their course programs in the coming years and will need strengthening of both their intellectual resources and equipment base. Finally, Xinhua Shudian will be facing major challenges in its role as book seller, accommodating to the new uncertainties of the market place. Some assistance in the management of market-oriented book distribution may be required.

4.38 Working together with the national institutions just described are a large number of individual publishing enterprises that are instrumental in supplying the nation's textbooks. The major such institutions are provincial publishing bureaus, university publishing houses, and line ministry publishing houses. All of these are keen to increase both the size and the quality of their output. However, if all were assisted, government resources would be spread too thinly to have a significant impact. In that case, what institutions should the Government strategy focus on as an initial priority? For the production of primary and secondary books, which use essentially the same technology nationwide, the poorest facilities determine the overall level of production. For example, as long as letterpress printing on 52 gsm paper is used, pictures will not reproduce adequately. Therefore, for primary and secondary books, assistance should go to the least advanced provincial publishing bureaus. Just the opposite tack should be taken at the higher education level. Here, a relatively small number of university and line ministry presses are producing books of good quality, and have the experience and skills to quickly expand and upgrade their output. These more advanced presses are likely to jointly market their books (para. 3.19), which will increase sales, make possible longer print runs, and ultimately make more efficient use of upgraded equipment. Therefore, for higher education books, priority should be given to the most advanced presses. The publishing houses assisted will each need a different configuration of technical assistance, training and equipment upgrading. The most efficient way to meet these individual needs is for the Government to solicit proposals from the presses, which would be developed following guidelines that outline the types of assistance available. The proposals would be evaluated according to agreed criteria that would ensure that investment would be for the purpose of upgrading the quality of textbooks and reference materials directly related to instructional programs in schools and universities. The type of assistance outlined, to both the core national institutions and individual publishing houses, would support the implementation of a program to upgrade China's textbooks, which is both realistic and of potentially great educational significance.

Annex 1
Chart 1
Page 1 of 2

Organization Chart of State Education Commission

Departments and Bureaus

1. General Office
2. Office of Policy Study
3. Bureau of Personnel
4. Bureau of Planning and Financing
5. Bureau of Foreign Affairs
6. Bureau of Capital Construction
7. Bureau of Instructional and Technical Provision
8. Bureau of Audio-Visual Education
9. Bureau of Administrative Management
10. Bureau of Veteran Cadres
11. First Department of Higher Education
12. Second Department of Higher Education
13. Third Department of Higher Education
14. Department of Postgraduate Education
15. Department of Political Education
16. Department of Science and Technology
17. Department of University Student Affairs
18. Department of Teacher Education
19. Department of Secondary Education
20. Department of Primary Education
21. Department of Minority Education
22. Department of Vocational and Technical Education
23. Department of Adult Education
24. Department of Physical and Health Education
25. Department of Inspection
26. Office for Higher Education Self-Study Examinations
27. Auditing Office
28. Office for Macro Educational Planning
29. Office of Teacher Management
30. Office of Foreign Investment and Loan
31. Office of Teaching Material, Library and Information Management
32. Office of The National Review Committee for Primary and Secondary School Textbooks
33. Office of Information Research

Centers

1. Center for Education Development and Policy Research
2. Center for Educational Information Management
3. Center for Examination Management
4. Research Center for Development in Social Sciences
5. Center for Science and Technology Management
6. Research Center for Education on Marxist Theories
7. Research Center for Instructional Materials for Ideological and Political Education for Primary and Secondary Schools

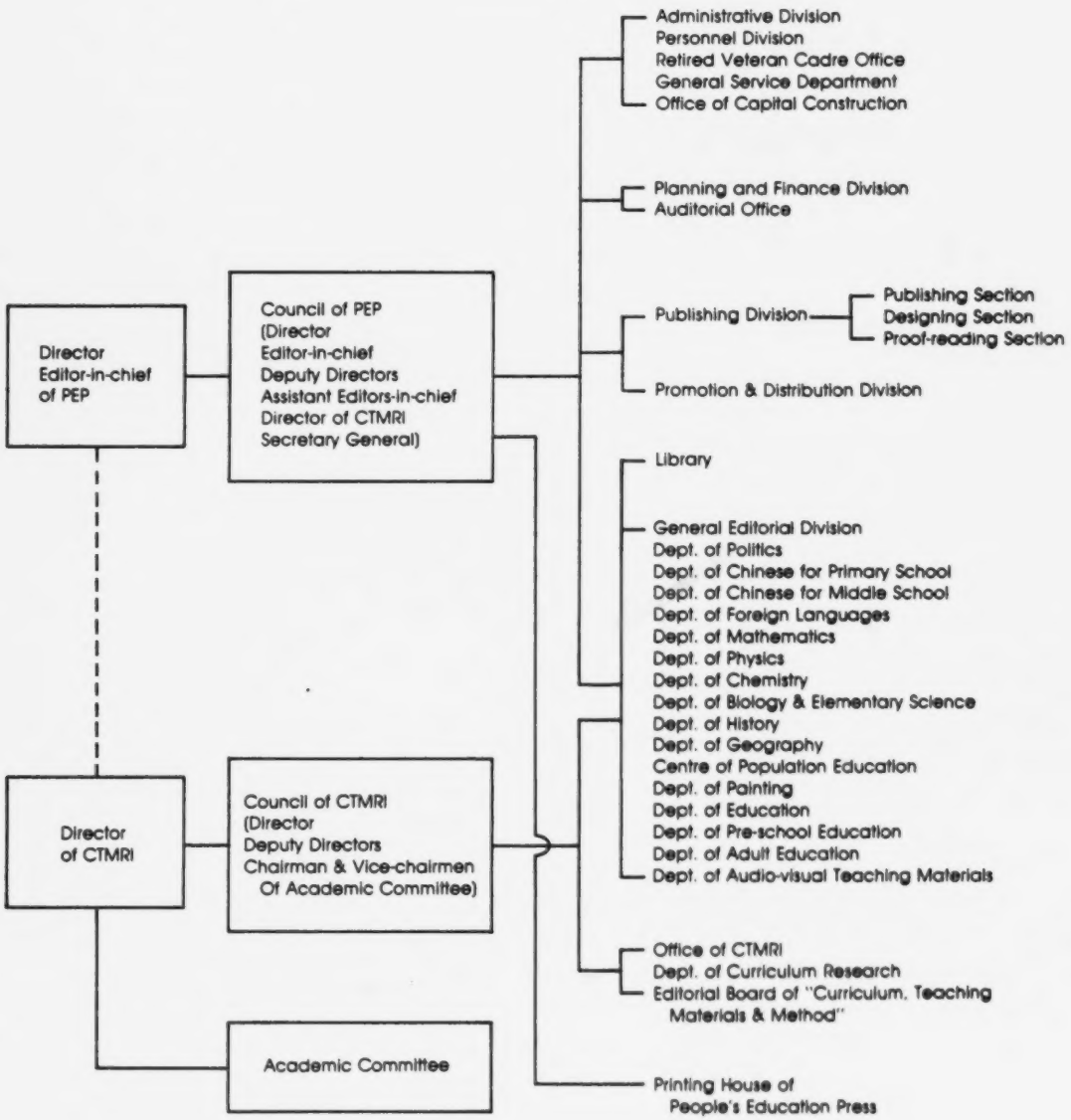
Enterprises and Institutes

1. Central Institute of Educational Science
2. China Education News
   - Editorial Department of China Education News
   - Editorial Department of People's Education
   - Editorial Department of China Higher Education
3. People's Education Press
4. Higher Education Publishing House
5. National Audio-Visual Education Center
6. China Educational Instruments and Equipment Corporation
7. Research Institute of Teaching Equipment
8. China Educational Service Center (Shenzhen)
9. Central Institute of Educational Administration
10. Central Radio and T.V. University
11. China T.V. Normal College

1. Office of the Academic Degree Committee of the State Council
2. Secretariat of the National Commission of the P.R.C. for UNESCO
3. Chinese Education Association for International Exchange
4. Chinese Society of Education
5. Chinese Society of Higher Education
6. China's Scholars Abroad (Journal)

CHART 2

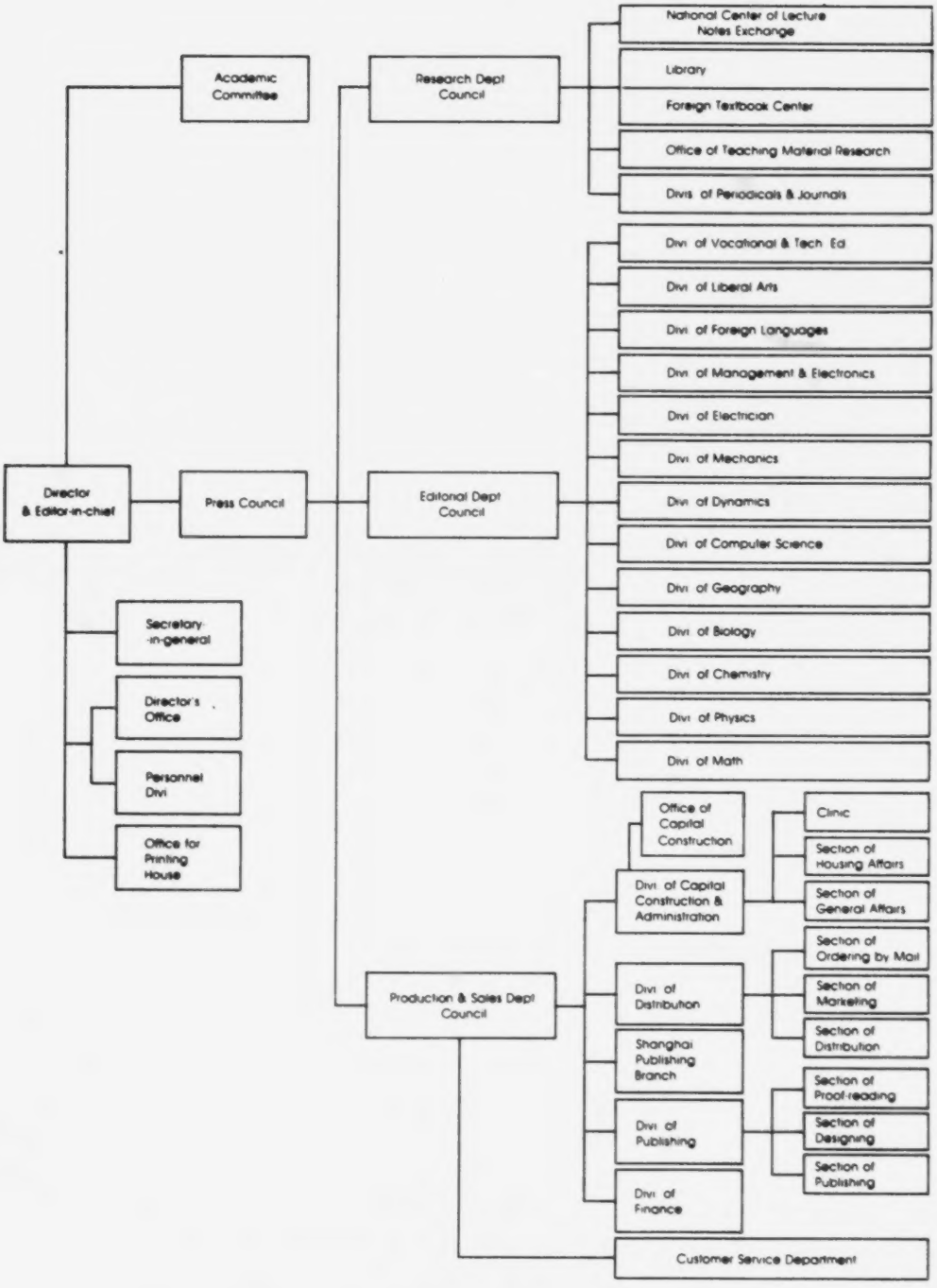
Organization of People's Education Press and Curriculum & Teaching Materials Research Institute


Director Editor-in-chief of PEP
Council of PEP (Director Editor-in-chief Deputy Directors Assistant Editors-in-chief Director of CTMRI Secretary General)
Director of CTMRI
Council of CTMRI (Director Deputy Directors Chairman & Vice-chairmen Of Academic Committee)
Academic Committee
Administrative Division
Personnel Division
Retired Veteran Cadre Office
General Service Department
Office of Capital Construction
Planning and Finance Division
Auditorial Office
Publishing Division
Publishing Section
Designing Section
Proof-reading Section
Promotion & Distribution Division
Library
General Editorial Division
Dept. of Politics
Dept. of Chinese for Primary School
Dept. of Chinese for Middle School
Dept. of Foreign Languages
Dept. of Mathematics
Dept. of Physics
Dept. of Chemistry
Dept. of Biology & Elementary Science
Dept. of History
Dept. of Geography
Centre of Population Education
Dept. of Painting
Dept. of Education
Dept. of Pre-school Education
Dept. of Adult Education
Dept. of Audio-visual Teaching Materials
Office of CTMRI
Dept. of Curriculum Research
Editorial Board of "Curriculum, Teaching Materials & Method"
Printing House of People's Education Press

World Bank—31154:1

CHART 3

Organizational Structure of HEPH



World Bank-31154.2

Institutional Framework for Textbook Provision: Role of State Commissions/Ministries/Bureaus

Institution		Role
State Education Commission (SEdC)	--	Has ultimate responsibility for provision of textbooks and specific responsibility for curriculum, pedagogical decisions, and policy making, through textbook offices and other offices
Peoples' Education Press (PEP, under SEdC)	--	Writes and publishes state textbooks for primary, secondary, teacher training
Higher Education Publishing House (HEPH, under SEdC)	--	Publishes textbooks for core science and engineering subjects for universities, specialized technical schools
Line Ministry Publishing Houses	--	Publish textbooks in their specialties, e.g. health, agriculture, machine building, finance
China National Publishing Administration (CNPA)	--	Responsible for textbook distribution through Xinhua Shudian (XHS), the state book wholesaling agency
China Printing Corporation (CPC, under CNPA)	--	Establishes pricing framework for printing, allocates printing resources for state controlled and some provincial printing factories
China Printing Materials Corporation (CPMC, under CNPA)	--	Allocates paper for books to educational publishing houses
State Planning Commission (SPC)	--	Coordinates long-term planning with regard to raw material availability and production capacity
Ministry of Finance (MOF)	--	Controls decisions on subsidies and preferential tax treatment for educational publishers
State Price Commission	--	Together with MOF and SEdC, determines textbook prices

Ministry of Light Industry	--	Supplies paper, to specifications established by CPMC
Ministry of Machine Building	--	Manufactures printing machines

ANNEX 1
Table 2

Procedures for Development and Distribution of Primary and Secondary Textbooks

I. Manuscript Development

Task	Responsible Agency /a
Set syllabus, develop guidelines for content	Office for NECPSST in SEdC
Research content, write manuscripts	CMTRI, PEP
Print trial copies of texts	PEP
Field test trial copies	CMTRI/PEP
Approve manuscript	NECPSST
Design books, typeset	PEP

II. Annual Book Distribution

Solicit textbook orders	Xinhua Shudian
Make paper matrices, distribute to provincial publishing bureaus	PEP
Print books, deliver to local XHS outlets	Provincial publishing bureaus/ printing houses
Distribute books	Local XHS outlets

/a NECPSST: National Evaluation Committee for Primary and Secondary School Textbooks.
CMTRI: Curriculum Materials Textbooks Research Institute.

Compiling Committees

Ministries and Their Committees to Edit and Review Teaching Materials for Institutions of Higher Learning

Ministry of Machine-Building

1. Editing and Polishing Committee for Teaching Materials of Machine-Building (Hot Working) Speciality
2. Machine-Building (Cold Working) Speciality
3. Dynamic Machinery Speciality
4. Electrotechnology
5. Automatization
6. Management Engineering on Machine-Building Industry
7. Instrument and Apparatus
8. Agricultural Machinery
9. Tractor
10. Internal Combustion Engines
11. Automobile
12. Engineering Machinery

Ministry of Aviation Industry

1. The First Editing and Polishing Committee for Teaching Materials on Aviation Industry
2. The Second Editing and Polishing Committee for Teaching Materials on Aviation Industry
3. The Third Editing and Polishing Committee for Teaching Materials on Aviation Industry

Ministry of Electronics Industry

1. Radio Technology and Information System
2. Electromagnetic Field and Microwave Technique
3. Electronic Materials and Solid Device
4. Electrophysics and Device
5. Electronic Machinery
6. Computer and Autocontrol

Ministry of Ordnance Industry

1. The First Editing and Polishing Committee
2. The Second Editing and Polishing Committee

Ministry of Urban and Rural Construction and Environmental Protection

1. Architecture and City Planning
2. Architectural Structure
3. Architectural Construction and Management
4. Heat Supply, Ventilation and Gas Combustion
5. Water Supply and Drainage and Environmental Engineering

Ministry of Water Conservancy and Power

1. Editing and Polishing Committee for Teaching Materials of Water Conservancy and Power Speciality
2. Power Engineering
3. Thermal Energy Dynamics

Ministry of Coal Industry

1. Coal Mining Engineering
2. Geology and Survey
3. Coal Mining Electrical Engineering

Ministry of Geology

1. General Geology
2. Geomorphology and the Quaternary Period Geology
3. Mineralogy
4. Structural Geology
5. Geomechanics
6. Petrology
7. Palaeontology
8. Historical Geology
9. Mineral Deposits
10. Geochemistry
11. Mineral Prospecting and Exploration
13. Hydrogeology
14. Petroleum Geology
15. Analysis of Rock Stratum
17. Electrical Prospecting
18. Magnetic Prospecting
19. Seismological Prospecting
20. Gravity Prospecting
21. General and Synthetic Prospecting
22. Under-Mine Geophysics
23. Remote Sensing Geology
24. Elementary Geology
25. Regional Structure
26. Geological Economics Management

State Bureau of Seismology

Seismology Speciality

Ministry of Railway

1. Diesel Locomotive Specialist
2. Vehicle Speciality
3. Railway Mechanization
4. Power Supply for Electric Railway
5. Railway Communication and Signal
6. Railway Automatization
7. Railway Transportation
8. Railway Engineering in Bridge and Tunnel

Ministry of Communications

1. Road and Bridge Speciality
2. Navigation

Ministry of Posts and Telecommunications

1. Rudimentary Communication Technique
2. Electric Communication Technique
3. Radio Technique
4. Electromagnetic Field and Microwave Technique
5. Computer Communication and Application
6. Microelectronics and Optoelectronics
7. Posts and Telecommunications Machinery
8. Posts and Telecommunications Management

Ministry of Textile Industry

1. Education Commission of Cotton Textile
2. Education Commission of Woolen Textile
3. Education Commission of Mechanical Weaving
4. Education Commission of Knitting
5. Education Commission of Textile Materials
6. Education Commission of Electrical Automatization of Industry
7. Education Commission of Automatization of Chemical Industry and Instrument
8. Education Commission of Dyeing and Finishing Engineering
9. Education Commission of Science of Chemical Fibre
10. Education Commission of Enterprise Management of Textile Industry
11. Education Commission of Clothing Speciality
12. Education Commission of Machine Building and Design

Ministry of Light Industry

1. Pulp and Paper Industry
2. Sugar Production
3. Food Technology
4. Ferment Technology
5. Plastic Modelling
6. Leather Industry
7. Chronographic Instruments
8. Automatization of Light Industry
9. Machinery of Light Industry
10. Pulp and Paper Machinery
11. Machinery of Plastic Industry

Ministry of Forestry

1. Forestry Speciality
2. Forest Protection
3. Water and Soil Conservancy
4. Desert Control
5. Economic Forestry
6. Gardening
7. Protection of Wild Animal
8. Transportation and Felling of Forest
9. Civil Engineering in Forest Zone
10. Wood Processing
11. Chemical Processing of Forest Products
12. Forestry Machinery
13. Woodworking Machinery
14. Forestry Economics
15. Chinese Teaching Material for Forestry Institutes
16. Package Teaching Material

Ministry of Public Health

1. Medical Science
2. Hygiene
3. Stomatology Speciality
4. Pediatrics
5. Pharmacology
6. Nursing Speciality
7. Chinese Material Medical
8. General Medicine

State Physical Culture and Sports Commission

Surveying and Mapping Speciality

State Commission of Education

Science Teaching Materials

1. Mathematics and Mechanics
2. Physics
3. Chemistry
4. Biology
5. Geography
6. Radio
7. Computer Software

Engineering Teaching Materials

8. Mathematics
9. Physics
10. Chemistry
11. Mechanics
12. Descriptive Geometry and Engineering Drafting
13. Elementary Machinery
14. Thermoengineering
15. Electrotechnology
16. College English Materials for Science and Engineering Students
17. Applying Mathematics
18. Applying Physics
19. Applying Dynamics
20. Applying Chemistry
21. Engineering Thermophysics
22. Engineering Management
23. Environmental Engineering
24. Biological Medicine Engineering and Instrument

State Bureau of Building Materials Industry

1. Nonmetallic Ore Speciality
2. Inorganic Nonmetallic Materials

Ministry of Nuclear Industry

1. Nuclear Reaction Engineering
2. Nuclear Physics
3. Radiation Chemistry and Nuclear Chemical Industry
4. Uranium Mineral Geology

State Publishing Houses Responsible for Publishing Teaching Materials for Institutions of Higher Learning

1. Machine-Building Industry Publishing House
2. Atomic Energy Publishing House
3. National Defense Industry Publishing House
4. Water Conservancy and Electric Power Publishing House
5. China Building Industry Publishing House
6. Chemical Industry Publishing House
7. Metallurgical Industry Publishing House
8. Coal Industry Publishing House
9. Petroleum Industry Publishing House
10. Geological Publishing House
11. China Railway Publishing House
12. People's Communications Publishing House
13. People's Post and Telecommunications Publishing House
14. Light Industry Publishing House
15. Textile Industry Publishing House
16. Surveying and Mapping Publishing House
17. Seismological Publishing House
18. Meteorological Publishing House
19. Agricultural Publishing House
20. Chinese Forestry Publishing House
21. People's Health Publishing House
22. People's Physical Culture Publishing House
23. Higher Education Publishing House
24. Electronics Industry Publishing House
25. People's Education Publishing House
26. Educational Sciences Publishing House
27. China Youth Publishing House
28. The Science Publishing House
29. Catalogues and Documentation Publishing House
30. Cultural Relics Publishing House
31. China Social Sciences Publishing House
32. Economic Science Publishing House
33. Archives Publishing House
34. Zhong Hua Book Company
35. The Commercial Press
36. People's Publishing House
37. People's Literature Publishing House

38. Beijing Publishing House
39. Cartographic Publishing House
40. People's Music Publishing House
41. China Financial and Economical Publishing House
42. Foreign Trade Publishing House
43. China Statistics Publishing House
44. China Finance Publishing House
45. China Commercial Publishing House
46. The Publishing House of Law
47. Qunzhong (The Masses) Publishing House
48. China Tourism Publishing House

ANNEX 1
Table 5

Provincial Publishing Houses Responsible for Publishing Technical Material for Institutions of Higher Learing

1. Shanghai People's Publishing House
2. Shanghai Education Publishing House
3. Shanghai Literature and Art Publishing House
4. Shanghai Classics Publishing House
5. Shanghai Translation Publishing House
6. Shanghai Scientific and Technological Publishing House
7. Tianjin People's Publishing House
8. Tianjin Scientific and Technical Publishing House
9. Hebei People's Publishing House
10. Liaoning People's Publishing House
11. Jilin People's Publishing House
12. Jilin Literature and History Publishing House
13. Zhejiang Scientific and Technical Press
14. Anhui Scientific and Technical Press
15. Jiangxi Scientific and Technical Press
16. Fujian People's Publishing House
17. Jiangxi Scientific and Technical Press
18. Shandong People's Publishing House
19. Shandong Education Publishing House
20. Shandong Scientific and Technical Press
21. Guangdong People's Publishing House
22. Guangdong Scientific and Technical Press
23. Hubei People's Publishing House
24. Hunan Scientific and Technical Press
25. Sichuan People's Publishing House
26. Sichuan Scientific and Technical Press
27. Gansu People's Publishing House
28. Shaanxi People's Publishing House
29. Shaanxi Scientific and Technical Press

University Publishers

1. People's University of China Press
2. Foreign Languages Teaching and Research Press
3. Shanghai Foreign Languages Education Press
4. China University of Political Science and Law Press
5. China People's Security University Press
6. Liaoning Institute of Finance and Economics Press
7. Central Institute for Nationalities Press
8. Zhejiang Academy of Fine Arts Press
9. Foreign Trade Education Press
10. Sichuan University of Finance and Economics Press
11. Beijing University Press
12. Fudan University Press
13. Wuhan University Press
14. Jilin University Press
15. Nanjing University Press
16. Shandong University Press
17. Zhongshan University Press
18. Lanzhou University Press
19. Sichuan University Press
20. Xiamen University Press
21. Liaoning University Press
22. Northwest University Press
23. Henan University Press
24. Nankai University Press
25. East China Normal University Press
26. Beijing Normal University Press
27. Notheast Normal University Press
28. Huazhong Normal University Press
29. Shaanxi Normal University Press
30. Southwest Normal University Press
31. Beijing Normal College Press
32. Qingua University Press
33. Huazhong Institute of Technology Press
34. Northwest Institute of Telecommunication Engineering Press
35. Shanghai Jiaotong University Press
36. Tongji University Press
37. Dalian Institute of Technology Press
38. Tianjin University Press
39. Chongqing University Press

40. Nanjing Institute of Technology Press
41. Hunan Institute of Technology Press
42. Hunan University Press
43. Harbin Institute of Naval Architecture Press
44. Wuhan Institute of Geology Press
45. National Defense University of Science and Technology Press
46. Beijing Institute of Aeronautics and Astronautics Press
47. Zhongshan Polytechnical University Press
48. China Mining Institute Press
49. Beijing Broadcasting Institute Press
50. Zhejiang University Press
51. Xian Jiaotong University Press
52. Harbin Polytechnical University Press
53. Chengdu Institute of Telecommunication Engineering Press
54. Chengdu University of Science and Technology
55. Northeast Institute of Technology Press
56. Southwest Jiaotong University Press
57. Beijing Agricultural University Press
58. Northeast Institute of Forestry Press
59. Shanghai Institute of Traditional Chinese Medicine Press
60. Beijing Physical Culture Institute Press
61. Beijing Language Institute Press
62. China University of Science and Technology Press
63. University of Inner Mongolia Press

ANNEX 2
Table 1

State-Unified Textbooks for Primary and Secondary Schools by Type and Price

School		Five-year system Type (no.)	Five-year system Total price (Yuan)	Six-year system Type (no.)	Six-year system Total price (Yuan)
Primary School					
Grade 1	Spring	5	1.92	4	1.74
	Autumn	6	2.04	6	2.24
	Subtotal	11	3.96	10	3.98
Grade 2	Spring	5	1.62	5	1.60
	Autumn	4	1.72	4	1.68
	Subtotal	9	3.34	9	3.28
Grade 3	Spring	4	1.66	4	1.56
	Autumn	6	2.04	6	1.96
	Subtotal	10	3.70	10	3.52
Grade 4	Spring	6	2.32	4	1.64
	Autumn	8	2.53	6	1.92
	Subtotal	14	4.85	10	3.56
Grade 5	Spring	6	2.14	5	1.88
	Autumn	10	3.16	9	2.65
	Subtotal	16	5.30	14	4.53
Grade 6	Spring			5	1.72
	Autumn			7	2.55
	Subtotal			12	4.27
Junior Middle School					
Grade 1	Spring			8	3.57
	Autumn			7	4.14
	Subtotal			15	7.71
Grade 2	Spring			4	1.70
	Autumn			10	5.08
	Subtotal			14	6.78
Grade 3	Spring			2	1.06
	Autumn			9	5.20
	Subtotal			11	6.26
Senior Middle School					
Grade 1	Spring			6	3.39
	Autumn			9	5.73
	Subtotal			15	9.12
Grade 2	Spring			1	0.76
	Autumn			8	5.21
	Subtotal			9	5.97
Grade 3	Spring			1	0.64
	Autumn			6	4.06
	Subtotal			7	4.70

Number of Students in Primary and Secondary Schools, 1985-2000
(10,000 persons)

Province/municipality/autonomous region	1985				1990				1995				2000			
	Primary schools	Lower secondary schools	Upper secondary schools	Total	Primary schools	Lower secondary schools	Upper secondary schools	Total	Primary schools	Lower secondary schools	Upper secondary schools	Total	Primary schools	Lower secondary schools	Upper secondary schools	Total
Beijing	73.4	42.2	12.0	127.6	68.8	45.0	12.9	126.7	70.0	47.5	14.2	131.7	71.8	48.5	15.4	135.7
Tianjin	73.3	27.3	8.6	109.2	68.5	31.7	9.3	109.5	70.0	36.8	10.2	117.0	71.2	39.4	11.1	121.9
Hebei	601.3	212.4	33.0	846.7	551.6	246.3	35.6	833.5	556.6	266.1	37.4	860.1	562.6	279.3	40.4	882.3
Shanxi	335.2	134.1	22.9	492.2	308.4	155.5	24.7	488.6	311.4	150.2	25.9	487.5	316.6	154.3	28.0	498.9
Nei Monggol	254.9	72.7	18.9	366.7	234.7	107.7	20.5	362.9	236.7	110.3	21.7	368.7	239.8	112.4	23.7	375.9
Liaoning	422.3	155.6	31.3	609.2	388.4	180.4	33.8	602.6	393.0	186.8	35.3	615.3	396.2	194.5	38.3	629.0
Jilin	299.8	116.9	21.8	438.5	276.4	130.6	23.5	430.5	276.6	133.6	24.7	434.9	286.0	138.7	26.7	451.4
Heilongjiang	467.8	168.2	33.6	669.6	429.8	195.1	36.2	661.1	433.1	206.7	38.2	678.0	438.4	210.2	41.0	689.6
Shanghai	85.1	36.0	12.6	133.7	74.5	41.0	13.6	134.1	80.8	43.6	15.3	139.7	84.1	43.8	16.3	144.2
Jiangsu	677.9	240.0	44.7	962.6	621.7	278.0	48.3	948.0	626.7	300.2	50.9	977.8	634.1	315.2	54.8	1,004.1
Zhejiang	384.9	152.3	25.3	562.5	353.8	176.1	27.3	557.2	356.8	190.6	29.1	576.5	361.9	200.1	31.0	593.0
Anhui	727.9	189.8	22.9	940.6	667.5	220.2	24.7	912.4	672.5	237.8	26.3	936.6	680.8	249.7	28.0	958.5
Fujian	372.4	90.0	14.9	482.3	342.2	104.4	21.5	468.1	345.2	112.8	22.8	480.8	349.0	118.4	24.4	491.8
Jiangxi	572.8	129.7	25.9	728.4	525.9	150.4	27.9	704.2	530.9	162.4	29.6	722.9	536.4	170.5	31.6	738.5
Shandong	894.1	308.0	48.3	1,250.4	819.6	357.3	52.2	1,229.1	827.6	380.5	54.9	1,263.0	836.0	401.2	59.2	1,296.4
Henan	1,035.0	305.2	52.3	1,392.5	948.6	354.0	56.4	1,359.0	957.1	382.3	60.4	1,399.8	967.5	405.4	63.9	1,436.8
Hubei	627.1	207.8	36.6	871.5	575.3	241.1	39.5	855.9	580.3	260.4	41.6	882.3	586.8	273.4	44.8	905.0
Hunan	773.4	199.6	48.3	1,021.3	713.2	231.5	52.1	996.8	719.2	250.0	54.8	1,024.0	727.5	262.5	59.1	1,049.1
Guangdong	758.5	228.2	38.8	1,025.5	695.8	264.5	41.9	1,002.2	699.7	285.7	44.0	1,029.4	709.7	300.0	47.2	1,056.9
Guangxi	531.5	96.5	19.8	647.8	488.0	111.9	21.4	621.3	492.1	126.5	22.7	641.5	497.8	128.8	24.3	650.9
Sichuan	1,427.6	339.0	48.9	1,815.5	1,307.0	392.3	52.8	1,752.1	1,319.0	423.7	55.4	1,798.1	1,333.1	443.9	59.8	1,837.8
Guizhou	447.7	78.4	13.2	539.3	411.7	95.0	14.2	520.6	414.5	101.1	15.2	530.8	419.6	103.3	16.1	539.0
Yunan	514.7	84.5	17.5	616.7	472.0	108.0	18.9	598.9	476.0	105.8	19.8	601.6	481.4	111.2	21.4	614.0
Xizang	12.6	1.6	0.3	14.5	12.4	1.8	0.4	14.6	12.8	2.0	0.5	15.3	13.2	2.2	0.6	16.0
Shaanxi	367.9	138.7	31.7	538.3	338.0	160.8	34.2	533.0	342.0	184.2	36.2	562.4	346.6	184.4	38.8	569.8
Gansu	270.3	80.7	19.3	370.3	249.0	93.6	20.8	363.4	251.8	101.4	21.9	375.1	254.0	106.2	23.5	383.7
Qinghai	54.2	17.9	5.2	77.3	50.5	20.7	5.6	76.8	51.2	22.5	6.1	79.7	51.8	23.8	6.5	82.1
Ningxia	65.4	18.5	5.3	89.2	60.3	21.5	5.7	87.5	61.7	23.2	6.3	91.2	62.5	24.6	6.7	93.8
Xinjiang	196.6	73.2	22.4	292.2	180.2	84.9	24.1	289.2	182.0	87.5	25.5	295.0	194.6	91.2	27.5	302.3
Total	13,325.6	3,965.2	741.3	18,032.1	12,238.5	4,601.3	800.0	17,634.8	12,347.5	4,902.1	847.1	18,096.7	12,500.0	5,138.3	910.1	18,548.4

78

79

ANNEX 2
Table 3

Production of Primary and Secondary Teaching Materials, 1985-2000

Province/municipality/autonomous region	1985		1990		1995		2000	
	No. of books (10,000 copies)	Paper consumed (1,000 reams)	No. of books (10,000 copies)	Paper consumed (1,000 reams)	No. of books (10,000 copies)	Paper consumed (1,000 reams)	No. of books (10,000 copies)	Paper consumed (1,000 reams)
Beijing	1,978	78.2	2,027	80.2	2,098	83.0	2,203	87.2
Tianjin	1,263	51.5	1,295	52.8	1,340	54.7	1,407	57.4
Hebei	10,084	361.6	10,336	370.6	10,700	383.6	11,235	402.8
Shanxi	5,638	210.7	5,719	216.0	5,981	723.1	6,280	234.7
Nei Mongol	4,572	170.2	4,686	174.5	4,850	180.6	5,093	189.6
Liaoning	8,636	296.9	8,852	303.3	9,162	313.9	4,620	324.6
Jilin	6,239	220.9	6,395	226.7	6,114	234.3	6,950	246.0
Heilongjiang	7,491	273.1	7,670	280.0	7,947	240.0	8,344	304.3
Shanghai	3,714	104.2	3,807	106.8	3,940	110.5	4,137	116.0
Jiangsu	11,991	431.0	12,240	441.8	12,720	457.3	13,356	480.1
Zhejiang	7,865	264.2	8,062	270.8	8,344	280.3	8,761	294.3
Anhui	9,856	349.1	10,102	358.4	10,455	370.9	10,978	389.5
Fujian	5,268	177.9	5,400	182.4	5,589	188.8	5,868	198.2
Jiangxi	7,506	261.1	7,694	268.5	7,463	277.9	8,361	291.8
Shandong	15,935	567.8	16,333	582.0	16,905	607.4	17,750	632.5
Henan	15,057	534.9	15,433	548.2	15,972	567.5	16,772	545.9
Hubei	9,757	345.2	10,001	353.8	10,351	366.2	10,689	387.5
Hunan	16,174	495.2	16,578	307.6	17,158	525.4	18,016	551.6
Guangdong	16,710	499.4	17,128	511.9	17,728	524.8	18,614	556.3
Guangxi	8,080	252.0	8,282	258.3	8,572	267.3	9,000	280.7
Sichuan	21,512	693.0	22,050	710.5	22,822	735.2	23,963	772.0
Guizhou	5,905	184.8	6,053	189.4	6,265	196.0	6,578	205.8
Yunnan	6,655	211.7	6,821	217.0	7,059	224.6	7,413	235.8
Xizang	210	8.6	216	8.8	224	9.1	235	10.0
Shaanxi	6,643	232.1	6,810	238.0	7,048	246.3	7,400	258.7
Gansu	4,623	163.1	4,738	167.2	4,904	173.0	5,150	182.0
Qinghai	823	30.3	844	31.1	874	32.2	917	34.0
Ningxia	1,463	45.7	1,500	46.3	1,553	48.0	1,631	50.0
Xinjiang	3,521	147.0	3,610	151.0	3,736	156.3	3,923	164.0
Total	225,169	7,661.1	230,800	7,853.5	238,874	8,128.7	250,643	8,535.2

ANNEX 2
Table 4

Production of Teaching and Learning Materials Between 1981-85
Higher Education Publishing House

Classification	1981				1982				1983				1984				1985			
	Title			Paper	Title			Paper	Title			Paper	Title			Paper	Title			Paper
	Total	First edit.	Number ('000)	used (ream)	Total	First edit.	Number ('000)	used (ream)	Total	First edit.	Number ('000)	used (ream)	Total	First edit.	Number ('000)	used (ream)	Total	First edit.	Number ('000)	used (ream)
Science courses for comprehensive universities	128	48	4,733	65,494	212	52	7,916	128,262	205	47	8,276	95,381	265	51	5,924	74,418	257	49	6,125	75,223
Science courses for normal universities	43	17	612	6,926	59	16	858	10,513	70	14	1,055	11,625	92	24	1,288	14,168	109	20	1,526	21,786
Courses of engineering	171	64	6,697	84,093	286	72	9,901	145,476	289	66	9,698	98,869	319	76	8,602	104,821	338	69	10,182	131,818
Science courses for normal colleges	5	5	38	487	13	8	97	1,243	23	10	174	2,247	36	15	273	3,414	42	8	315	3,930
General secondary specialized schools	42	7	3,776	23,450	51	10	5,913	37,224	60	15	4,843	39,587	69	19	6,201	59,124	94	18	9,118	80,545
Adult vocational & technical education	33	18	1,346	19,192	45	29	1,835	26,170	66	36	2,612	27,542	83	43	2,380	24,278	120	42	3,132	39,949
Courses of liberal and physical	10	-	79	830	10	-	73	767	10	-	70	735	42	32	336	277	16	4	304	3,192
Courses of foreign language	67	22	2,711	29,017	73	25	2,955	32,623	91	27	3,683	39,421	103	17	2,786	33,622	102	24	3,274	41,494
Reference books and others	98	41	1,186	14,156	104	53	1,258	16,014	106	61	1,283	14,312	104	63	1,528	16,933	116	48	1,453	22,614
Total	597	222	21,178	243,772	853	268	30,786	398,292	920	276	31,694	330,610	1,113	340	29,320	331,055	1,184	282	35,429	620,548
Syllabuses	47	47	165	103	41	41	624	383	5	5	43	27	48	-	350	156	132	71	990	743
Periodicals	1	1	24	24	1	1	30	45	1	1	36	72	2	2	126	315	2	2	198	594
Grand Total	645	270	21,367	243,772	895	310	31,440	398,720	926	282	31,773	330,709	1,163	342	29,796	331,526	1,318	355	36,617	421,885

ANNEX 2
Table 5

Number of Printed Teaching Materials in Some Key Institutes and Universities in 1985

Key institutes/ universities	Number of special-ties	Number of courses	Total No. of students	Number of printed teaching materials					
				Number of sorts	Estimated number of copies	Estimated number of words ('000)	No. of mimeo-graph copies	No. of typo-graphic copies	No. of offset printed copies
Beijing University	76	1,449	14,957	1,053	295,000	55,000	1,048	8	2
Fujian University	94	1,897	10,524	532	130,000	35,000	306	2	24
Nankai University	106	2,200	8,300	2,100	83,000	4,150	1,200	800	100
Jilin University	89	1,563	8,320	265	45,970	30,000	262	3	-
Qinghua University	47	1,720	12,519	254	154,214	25,400	220	15	19
Xi'an Jiao Tong University	43	300	12,032	578	26,928	67,000	553	-	25
Nanjing Institute of Technology	-	344	9,029	380	25,000	80,000	330	10	20
Tianjin University	54	1,681	10,787	290	113,757	42,570	236	48	6
Chengdu Institute of Telecommunication Engineering	25	637	6,900	163	71,196	15,660	155	6	2
Beijing Agricultural University	24	550	2,200	95	35,000	8,600	78	17	-
Capital Medical University	3	35	1,615	87	38,270	-	81	6	-
Beijing Medical University	3	175	3,678	149	69,317	9,380	135	14	-

ANNEX 2
Table 6

Publication of Textbooks for Universities, Colleges, Polytechnics, 1981-85

Year	Universities and colleges				Polytechnics			
	Titles		Copies	Sheets	Titles		Copies	Sheets
	Total	Newly published	---- ('000) -----		Total	Newly published	---- ('000) -----	
1981	1,607	823	47,700	662,692	517	170	17,550	227,220
1982	1,863	587	48,640	619,709	595	151	20,200	230,560
1983	1,984	563	79,810	976,487	652	214	32,300	332,935
1984	2,224	675	77,200	1,041,368	745	170	31,420	343,673
1985	2,446	802	79,050	1,089,069	828	217	42,630	500,007
Total	12,167	4,857	501,310	6,038,207	4,226	1,584	231,280	2,265,338

Note: 16,393 titles; 6,441 titles newly published.
732,590,000 copies.
8,303,545 reams (1 ream = 1,000 sheets)

ANNEX 2
Table 7

Schedule for Primary and Secondary Textbook Production

	Fall semester	Spring semester
Early estimate of book requirements	February	August
Book orders placed by schools	April 20	October 5
Deadline for seding manuscripts to printing house	Late May	Before December
Book printing completed by printing house	July 20	January 20
Books delivered to retail bookstores	August 13	February 5
Books received by schools	August 28	February 20
Start of semester	September 1	March 2

Sources: Publishing Bureaus of Jiangsu Province and Xinjiang Uygur Autonomous Region.

Price Schedule for Textbooks

	Price per printed sheet (Y)
Technical School/Vocational Secondary School	
Vocational secondary school (Math, physics, chemistry, Chinese, foreign language, politics, etc.)	0.10
Specialized secondary school, TV specialized school (Politics, Chinese, physical training, etc.)	
Specialized secondary school, TV specialized school basic courses (math, physics, chemistry, etc.)	0.11
Specialized secondary school, TV specialized technical school basic courses	0.11
(Beyond 30,000 copies)	0.11
(Under 30,000 copies)	0.12
Specialized secondary school, TV specialized school special courses (Applied techniques, applied liberal arts, biology and geography, etc.)	0.14
Reference books for teachers in specialized secondary school and TV specialized school	0.14
Vocational secondary school special courses (Applied techniques)	0.12
University, Specialized College (Science & Engineering)	
University, specialized college workers training university, correspondence university, TV university, science and engineering and basic course books and public foreign language course books	0.13
Teachers training science and engineering basic course books (math, physics, chemistry, biology, geography and foreign language)	0.13

	Price per printed sheet (Y)
University, specialized college, workers training university, correspondence university, TV university, science and engineering technical basic course books and specialized basic course books	
(Beyond 30,000)	0.13
(Under 30,000)	0.14
University, specialized college, workers training university, correspondence university, TV university, science and engineering specialized course books (Science departments: math, physics, chemistry, biology, geography, etc., all the course books for engineering departments, eight discipline-crossed sciences specialized course books)	0.16
University, specialized college science & engineering selective course books, post-graduate course books, teaching reference books	0.16
Teacher training science and engineering specialized course books	0.16
University, Specialized College (Liberal Arts)	
University, specialized college, workers training university, correspondence university, TV university, liberal arts basic course books	0.12
Teachers training liberal arts basic course books (Chinese, politics)	0.12
University, specialized college, workers training university, correspondence university, TV university, liberal arts specialized course books	0.14

	Price per printed sheet (Y)
Other	
Examination for adult higher education course books	0.12
General science & technical books, books on translation, specialized technical pamphlets	0.18
Teaching outlines	0.18
Higher universities and colleges education science, psychology books	0.16
Collection on education materials	0.18
Compiled by HEPH or translated science and technical specialized works, dictionaries and reference materials	0.20

ANNEX 3
Table 2

HEPH Specimen Price Calculations

1986	Engineering Thermodynamics		850 mm x 1,168 mm
	16.5 printing sheet	x 0.14 + 20% = 2.772	
	Price of covers	0.08	
	Sewing binding	16.5 x 0.005 = 0.0825	
	Total	2.9345 = 2.95	
1985	Physics		850 mm x 1,168 mm
	17.625 printing sheet	x 0.16 = 2.82 + 20% = 3.384	
	Special paper covers	0.12	
	Sewing binding	17.625 x 0.005 = 0.08815	
	Total	3.592 = 3.60	

ANNEX 3
Table 3

Capital Requirements to Meet Year 2000 Targets:
Primary and Secondary

Item	Number	Estimated Unit cost (US$ mln)	Estimated Total (US$ mln)	Total (Y mln)
	Origination			
PEP				
Laser typesetter	1	0.5	0.5	
Other equipment /a		1.0	1.0	
Provinces				
Phototypesetter	40	0.035	1.4	
Other equipment /a	30	0.5	15.0	
Subtotal			17.9	66.2
	Printing			
Four color web offset press	16	4.0	64.0	
Monochrome web offset press	34	1.5	51.0	
Large scale offset perfector press	8	0.8	6.4	
Subtotal			121.4	449.2
Binding				
Automatic sewing machine	30	0.05	1.5	
Binding machine fully mechanized	36	1.5	54.0	
Subtotal			55.5	205.4
Total			194.8	720.8

/a For color preparation, film production, preparation of nylon, plastic plates.

ANNEX 3
Table 4

Capital Requirements to Meet Year 2000 Targets:
Higher Education

Item	Number	Estimated Unit cost (US$ mln)	Estimated Total (US$ mln)	Total (Y mln)
Origination				
HEPH				
Laser typesetter	10	0.5	5.0	
Other equipment /a			0.3	
Universities, Line Ministries				
Laser typesetter	25	0.5	12.5	
Other equipment /a			10.0	
Subtotal			27.8	102.9
Printing				
Large scale offset perfector press	50	0.8	40.0	
Small offset press /b	800	0.035	28.0	
Subtotal			68.0	251.6
Binding				
Binding machine partially mechanized	12	1.0	12.0	
Subtotal			12.0	44.4
Total			107.8	398.9

/a For color film production.

/b For "mimeograph" units.

ANNEX 3
Table 5

Relation of Print Run to Profitability for Recently Published Higher Education Textbooks

Book	Number of pages	Print run (number)	Cost per ream (Y)	Selling price per sheet (Y)	Cost per copy (Y)	Sales revenue per copy (Y)	Profit (Y)
A	520	3,000	255	0.14	4.15	1.58	-7,731
B	730	5,000	139	0.15	3.17	2.28	-4,445
C	726	10,000	144	0.14	3.49	2.28	-12,080
D	832	20,000	113	0.20	1.18	1.47	5,920
E	720	40,000	61	0.12	1.37	1.91	21,800
F	272	100,000	63	0.14	0.54	0.84	29,900
G	344	180,000	63	0.14	0.67	1.07	71,820
H	368	570,000	68	0.15	0.78	1.21	244,530

GLOSSARY OF PRINTING TERMS

Bookblock

1. The completed book without its cover. In the Chinese context this consists of a number of folded sections and separate leaves (color illustrations) that have been attached to one another by wire or thread.

Color Scanner

2. An electronic machine which can separate a full color original (either flat art or transparency) into four separate colors for four color printing. These colors are magenta, cyan, yellow and black.

Film Lamination

3. A very thin plastic sheet of film which is applied to a printed sheet to protect it and to make it more attractive by giving it a gloss.

GSM

4. Grams per square meter. A method of measuring the weight of a given variety of paper and of comparing it with other varieties.

Halftone

5. The method of reproducing continuous tone originals in both the letterpress and offset processes. The original illustration is broken down into a series of dots of different sizes. This is done photographically using a half tone screen, or it can be done in a scanner.

Laser Typesetting

6. An electronic method of typesetting by which the characters are generated digitally as a series of very fine dots on film or photographic paper.

Letterpress

7. The oldest printing process which involves the printing surface standing proud (in relief) of the nonprinting surface. An inking roller inks only the printing surface which is then pressed into contact with the paper to be printed.

Letterpress Format

8. A term which applies specifically within China. The printed sheet is 787 x 1,092 mm. Thirty-two pages are printed on each side of the sheet. The sheet is cut and folded to give (normally) two thirty-two page sections or signatures. The untrimmed page size of the folded sections is 136.5 mm (spine to foredge) x 196.75 mm (head to foot). The trimmed page size is 133 m x 190 mm approximately.

Mechanical/Part Mechanical (Groundwood/Part Groundwood (US))

9. If the material used to make paper is broken down into fibers mechanically rather than chemically, the resulting sheet of paper is described as a 'mechanical' sheet. If the sheet is made using a combination of mechanically prepared and chemically prepared fibers it is known as a 'part-mechanical' sheet.

Monochrome

10. One color, normally black.

Offset/Offset Litho

11. A printing process which makes use of the antipathy of grease and water. The printing area is flush with the nonprinting area. This is a planographic process. The printing area is prepared photographically to be ink receptive and water repellent. The entire printing plate is first dampened and then inked. The water adheres to the nonprinting area and repels the ink, which adheres only to the printing area. The printing image is then transferred (offset) to a rubber blanket and from the blanket it is transferred again to the sheet of paper to be printed.

Offset Format

12. A term used in China and a few other countries. The printed sheet is 880 x 1,230 mm. Thirty-two pages are printed on each side of the sheet. The sheet is cut and folded to give (normally) two thirty-two page sections or signatures. The untrimmed page size of the folded sections is 153.75 mm (spine to foredge) x 220 mm (head to foot). The trimmed page size is 150 mm x 214 mm approximately.

Origination

13. All those operations involved in preparing text and illustrations so that they can be printed. This includes typesetting, preparing monochrome line and half tone illustrations, separating four color illustrations and making printing plates when appropriate for the printing process.

Paper Matrix

14. See Stereo.

Perfect Binding/Unsewn Binding

15. A method of binding that dispenses with sewing and wire stitching. The spines of the folded sections are cut away to leave single leaves of paper. The cut edges are then coated with a special adhesive and a cover or spine lining is attached to the cut edges. The process is cheaper than conventional binding, but the end product is often weaker.

Perfector

16. A printing machine that prints both sides of a sheet of paper in one passage through the machine. Most commonly applied to sheet-fed offset litho machines.

Ream

17. As used in China this means 1,000 printed sides. As used in Western countries this means 500 sheets. Taking 'letterpress format' as an example the relationship between the two terminologies can be explained as follows. Five-hundred sheets of letterpress format paper have a total of 1,000 sides (2 sides per sheet). When 1,000 printing impressions have been made, all 500 sheets will be printed on both sides. Each sheet is then cut and folded to give two sections or signatures. Thus 500 sheets will give 1,000 signatures.

Section Sewn

18. A method of binding using thread. The threads are drawn into the spines of folded sections on a sewing machine using special sewing needles. Each folded section is attached to the section before it and the section after it by these threads. The finished book can be opened flat, and the threads can be seen in the center of each section.

Sheet Fed

19. Printing and machines that print single sheets of paper at a time.

Side Sewn

20. A method of binding using thread. The sewing threads are introduced into the side of the folded sections approximately 4 mm from the spine. All the sections of a book are sewn simultaneously with a series of stitches that run from the head of the bookblock to the foot. This method is faster and cheaper than section sewing, but the books cannot be opened flat, and less of the printed page area is usable since a portion is taken up by the sewing.

Side Stitched/Side Stabbed

21. This method of binding is similar to side sewing except that two wire staples are used in place of the continuous series of thread stitches. When a book is side stitched the ends of the staples protrude and are folded back flush with the paper. When a book is side stabbed the ends of the staples do not protrude (normally because the book is too thick) and a further

two staples have to be inserted from the other side of the bookblock to make sure that the book holds together.

Signature

22. A signature or section is a folded sheet of printed paper forming part of a book.

Stereo

23. A cast metal duplicate of original letterpress printing material. Type and illustrations are pressed into papier mache to make a flong or paper matrix. Molten metal is cast in this matrix to produce a duplicate plate.

Web Offset/Web Letterpress

24. Printing processes that use reels (rolls) of paper instead of separate sheets. The production is quicker and if print quantities are sufficiently high it is more economical. Web presses normally fold the printed paper as well.

Wirestitched

25. This term normally applies to single section books that are bound using two staples in the spine of the section. A book bound in this way can normally open flat. However, this binding process is limited by the weight of paper and the number of pages. It is not common to wire stitch books of more than 96 pages.

Woodfree/(Free Sheet (US))

26. This term is applied to paper which is neither mechanical nor part-mechanical. It means that all the fibers in the paper have been broken down chemically. Paper of this kind has a longer life and greater strength than mechanical and part-mechanical papers.

Bibliography

1. Searle, B. 1985, GENERAL OPERATIONAL REVIEW OF TEXTBOOKS. Washington, D.C.: World Bank, Discussion Paper, Education and Training Series, Report No. EDT1.

The paper reviews World Bank experience with textbooks, highlighting the technical and complex nature of book provision systems. Key issues raised are financial feasibility of textbook provision, coordination between curriculum and textbook development, book quality and teacher training. The importance of adopting a comprehensive and long-term perspective in project planning is stressed. The paper also addressed several project shortcomings such as inadequate distribution systems and poor quality books. The paper concludes with a set of recommendations for resolving the problems in project preparation and implementation.

2. Heyneman, S.P. Farrell, J.P.: Sepulveda-Stuardo, M.A. October 1978. TEXTBOOKS AND ACHIEVEMENT: WHAT WE KNOW. Washington, D.C.: World Bank, Staff Working Paper No. 298.

The paper reviews the published evidence from less industrialized societies on the relationship between textbook availability and academic achievement. Data are available from twelve countries.

The availability of books appears to be the most consistent school factor in predicting academic achievement. However, books do not have a uniform impact, showing relatively little effect in some circumstances. The paper discusses four areas for future research and evaluation: (i) analysis of existing sets of survey information; (ii) collection of new data from intervention experiments; (iii) studies of book production and use in classrooms; and (iv) the exploration of questions on distribution, equity, and costs.

3. Heyneman, S.P.; Jamison, D.T. June 1980. STUDENT LEARNING IN UGANDA: TEXTBOOK AVAILABILITY AND OTHER FACTORS. Washington, D.C.: World Bank.

This paper reports on the findings of part of a broader World Bank research program that is designed to provide evidence on factors contributing to efficiency in learning. It reports on the impact of school resources on student learning, taking the school as the unit of analysis. It also takes the pupil as the unit of analysis and estimates the impact both of pupil characteristics and of school characteristics on student learning.

4. Heyneman, S.P.; Jamison, D.T.; Montenegro, X. January 1984. TEXTBOOKS IN THE PHILIPPINES: EVALUATION OF THE PEDAGOGICAL IMPACT OF A NATIONWIDE INVESTMENT--Educational Evaluation and Policy Analysis. Vol. 6, No. 2, p. 139-150.

In the 1977-78 school year, the Government of the Philippines distributed a sufficient number of improved textbooks in Science, Mathematics, and Pilipino Language to improve the student:textbook ratio to 2:1. This intervention was accompanied by pre- and post-testing, as well as other data gathering, to allow an evaluation of the impact. This analysis has been undertaken as part of the World Bank's research project "Textbook Availability and Educational Quality." It reports results of the evaluation of the project's impact in its first year. Results indicate that the production and distribution of high quality text materials substantially improve student knowledge of science, mathematics and language.

5. Neumann, P.H. June 1980. PUBLISHING FOR SCHOOLS--TEXTBOOKS AND THE LESS DEVELOPED COUNTRIES. Washington, D.C.: World Bank, Staff Working Paper, No. 398.

This paper serves as a survey and reference about the process of educational publishing, its role in developing human resources and upgrading education. Special emphasis (including case studies) is given to the problem faced by developing countries and ways by which to assist them. Suggestions for a blueprint and for the execution of a project are included.

The author views textbooks as a constantly cost-effective tool for upgrading academic achievements in poorer schools with less qualified teachers. Textbook programs require professional competence to design; other prerequisites for success are discussed.

6. Neumann, P.H.; Cunningham, M.A. 1982. MEXICO'S FREE TEXTBOOKS--NATIONALISM AND THE URGENCY TO EDUCATE. Washington, D.C.: World Bank, Staff Working Paper, No. 541.

This is a study of the Mexican experience with free primary school textbooks: their development, publication and distribution. The study describes how Mexico met and essentially overcame the political, economical and technical obstacles associated with a large-scale national free textbook program.

The Mexican experience highlights the importance of textbook development, of government's long-range commitment, of policy decisions on who should be the producer of textbooks, of the organization of publishing and printing (separately) and of the ways and effects of providing books.

7. Pearce, D. 1982. TEXTBOOK PRODUCTION IN DEVELOPING COUNTRIES--SOME PROBLEMS OF PREPARATION, PRODUCTION AND DISTRIBUTION. Paris, France: UNESCO, Studies on Books and Reading, No. 7.

This document is one of a series prepared as background material for the World Congress on Books to be held in London in June 1982. It deals with

the various stages of textbook publishing, which is the mainstay of the book industry in most less developed countries. The difficulties that both government and private-sector textbook publishing organizations have to face and some methods of overcoming them are discussed.

The paper is directed at educationists and administrators working in projects connected with textbooks.

8. Dieuzeide, H. 1983. PROSPECTS (Quarterly Review of Education). Paris, France: UNESCO, Quarterly Review of Education, Vol. XIII, No. 3.

There are five articles on Textbooks in Developing Countries in this quarterly issue:

- Key issues of Textbooks Provision in the Third World, by Philip G. Altbach
- Textbook Production in Developing Countries, by Douglas Pearce;
- The Role of Textbooks in Asian Education, by S. Gopinathan;
- The Philippine Textbook Project, by Pacifico N. Aprieto; and
- Nepal: for Better Planning of Textbook Production, by K.C. Yadunandan

DISTRIBUTORS OF WORLD BANK PUBLICATIONS

ARGENTINA
Carlos Hirsch, SRL
Galeria Guemes
Florida 165, 4th Floor-Ofc. 453/465
1333 Buenos Aires

AUSTRALIA, PAPUA NEW GUINEA, FIJI, SOLOMON ISLANDS, VANUATU, AND WESTERN SAMOA
Info-Line
Overseas Document Delivery
Box 506, GPO
Sydney, NSW 2001

AUSTRIA
Gerold and Co.
A-1011 Wien
Graben 31

BAHRAIN
MEMBR Information Services
P.O. Box 2750
Manama Town 317

BANGLADESH
Micro Industries Development Assistance Society (MIDAS)
G.P.O. Box 800
Dhaka

BELGIUM
Publications des Nations Unies
Av. du Roi 202
1060 Brussels

BRAZIL
Publicacoes Tecnicas Internacionais Ltda.
Rua Peixoto Gomide, 209
01409 Sao Paulo, SP

CANADA
Le Diffuseur
C.P. 85, 1501 Ampere Street
Boucherville, Quebec
J4B 5E6

COLOMBIA
Enlace Ltda.
Carrera 6 No. 51-21
Bogota D.E.

Apartado Aereo 4430
Cali, Valle

COSTA RICA
Libreria Trejos
Calle 11-13
Av. Fernandez Guell
San Jose

COTE D'IVOIRE
Entre d'Edition et de Diffusion Africaines (CEDA)
04 B.P. 541
Abidjan 04 Plateau

CYPRUS
MEMRB Information Services
P.O. Box 2098
Nicosia

DENMARK
SamfundsLitteratur
Rosenoerns Alle 11
DK-1970 Frederiksberg C.

DOMINICAN REPUBLIC
Editora Taller, C. por A.
Restauracion
Apdo. postal 2190
Santo Domingo

EGYPT, ARAB REPUBLIC OF
Al Ahram
Al Galaa Street
Cairo

FINLAND
Akateeminen Kirjakauppa
P.O. Box 128
SF-00101
Helsinki 10

FRANCE
World Bank Publications
66, avenue d'Iéna
75116 Paris

GERMANY, FEDERAL REPUBLIC OF
UNO-Verlag
Poppelsdorfer Alle 55
D-5300 Bonn 1

GREECE
KEME
24, Ippodamou Street
Athens-11635

GUATEMALA
Librerias Piedra Santa
Centro Cultural Piedra Santa
11 calle 6-50 zona 1
Guatemala City

HONG KONG, MACAU
Asia 2000 Ltd.
6 Fl., 146 Prince Edward Road, W.
Kowloon
Hong Kong

HUNGARY
Kultura
P.O. Box 139
1389 Budapest 62

INDIA
Allied Publishers Private Ltd.
751 Mount Road
Madras—600 002

15 J.N. Heredia Marg
Ballard Estate
Bombay—400 038

13/14 Asaf Ali Road
New Delhi—110 002

17 Chittaranjan Avenue
Calcutta—700 072

Jayadeva Hostel Building
5th Main Road Gandhinagar
Bangalore—560 009

3-5-1129 Kachiguda Cross Road
Hyderabad—500 027

Prarthana Flats, 2nd Floor
Near Thakore Baug, Navrangpura
Ahmedabad—380 009

Patiala House
16-A Ashok Marg
Lucknow—226 001

INDONESIA
Pt. Indira Limited
Jl. Sam Ratulangi 37
Jakarta Pusat
P.O. Box 181

IRELAND
TDC Publishers
12 North Frederick Street
Dublin 1

ISRAEL
The Jerusalem Post
The Jerusalem Post Building
P.O. Box 81
Romema Jerusalem 91000

ITALY
Licosa Commissionaria Sansoni SPA
Via Lamarmora 45
Casella Postale 552
50121 Florence

JAPAN
Eastern Book Service
37-3, Hongo 3-Chome, Bunkyo-ku 113
Tokyo

JORDAN
Jordan Center for Marketing Research
P.O. Box 3143
Jabal
Amman

KENYA
Africa Book Service (E.A.) Ltd.
P.O. Box 45245
Nairobi

KOREA, REPUBLIC OF
Pan Korea Book Corporation
P.O. Box 101, Kwangwhamun
Seoul

KUWAIT
MEMRB
P.O. Box 5465

MALAYSIA
University of Malaya Cooperative Bookshop Limited
P.O. Box 1127, Jalan Pantai Baru
Kuala Lumpur

MEXICO
INFOTEC
Apartado Postal 22-860
Col. PE/A Pobre
14060 Tlalpan, Mexico D.F.

MOROCCO
Societe d'Etudes Marketing Marocaine
2 Rue Moliere, Bd. d'Anfa
Casablanca

THE NETHERLANDS
InOr Publikaties
Noorderwal 38
7241 BL Lochem

NEW ZEALAND
Hills Library and Information Service
Private Bag
New Market
Auckland

NIGERIA
University Press Limited
Three Crowns Building Jericho
Private Mail Bag 5095
Ibadan

NORWAY
Tanum-Karl Johan, A.S.
P.O. Box 1177 Sentrum
Oslo 1

OMAN
MEMRB Information Services
P.O. Box 1613, Seeb Airport
Muscat

PAKISTAN
Mirza Book Agency
65, Shahrah-e-Quaid-e-Azam
P.O. Box No. 729
Lahore 3

PERU
Editorial Desarrollo SA
Apartado 3824
Lima

THE PHILIPPINES
National Book Store
701 Royal Avenue
Metro Manila

POLAND
ORPAN
Palac Kultury i Nauki
00-901 WARSZAWA

PORTUGAL
Livraria Portugal
Rua Do Carmo 70-74
1200 Lisbon

SAUDI ARABIA, QATAR
Jarir Book Store
P.O. Box 3196
Riyadh 11471

SINGAPORE, TAIWAN, BURMA, BRUNEI
Information Publications
Private, Ltd.
02-06 1st Fl., Pei-Fu Industrial
Bldg., 24 New Industrial Road
Singapore

SOUTH AFRICA
For single titles:
Oxford University Press Southern Africa
P.O. Box 1141
Cape Town 8000

For subscription orders:
International Subscription Service
P.O. Box 41095
Craighall
Johannesburg 2024

SPAIN
Mundi-Prensa Libros, S.A.
Castello 37
28001 Madrid

SRI LANKA AND THE MALDIVES
Lake House Bookshop
P.O. Box 244
100, Sir Chittampalam A. Gardiner Mawatha
Colombo 2

SWEDEN
For single titles:
ABCE Fritzes Kungl. Hovbokhandel
Regeringsgatan 12, Box 16356
S-103 27 Stockholm

For subscription orders:
Wennergren-Williams AB
Box 30004
S-104 25 Stockholm

SWITZERLAND
Librairie Payot
6 Rue Grenus
Case postal 381
CH 1211 Geneva 11

TANZANIA
Oxford University Press
P.O. Box 5299
Dar es Salaam

THAILAND
Central Department Store
306 Silom Road
Bangkok

TRINIDAD & TOBAGO, ANTIGUA, BARBUDA, BARBADOS, DOMINICA, GRENADA, GUYANA, JAMAICA, MONTSERRAT, ST. KITTS AND NEVIS, ST. LUCIA, ST. VINCENT & GRENADINES
Systematics Studies Unit
55 Eastern Main Road
Curepe
Trinidad, West Indies

TURKEY
Haset Kitapevi A.S.
469, Istiklal Caddesi
Beyoglu-Istanbul

UGANDA
Uganda Bookshop
P.O. Box 7145
Kampala

UNITED ARAB EMIRATES
MEMBR Gulf Co.
P.O. Box 6097
Sharjah

UNITED KINGDOM
Microinfo Ltd.
P.O. Box 3
Alton, Hampshire GU 34 2PG
England

VENEZUELA
Libreria del Este
Apdo. 60.337
Caracas 1060-A

YUGOSLAVIA
Jugoslovenska Knjiga
YU-11000 Belgrade Trg Republike

ZIMBABWE
Textbook Sales Pvt. Ltd.
Box 3799
Harare

RECENT WORLD BANK DISCUSSION PAPERS (continued)

No. 19. The Public Revenue and Economic Policy in African Countries: An Overview of Issues and Policy Options. Dennis Anderson

No. 22. Demographic Trends in China from 1950 to 1982. Kenneth Hill

No. 23. Food Import Dependence in Somalia: Magnitude, Causes, and Policy Options. Y. Hossein Farzin

No. 24. The Relationship of External Debt and Growth: Sudan's Experience, 1975-1984. Y. Hossein Farzin

No. 25. The Poor and the Poorest: Some Interim Findings. Michael Lipton

No. 26. Road Transport Taxation in Developing Countries: The Design of User Charges and Taxes for Tunisia. David Newbery, Gordon Hughes, William D.O. Paterson, and Esra Bennathan

No. 27. Trade and Industrial Policies in the Developing Countries of East Asia. Amarendra Bhattacharya and Johannes F. Linn

No. 28. Agricultural Trade Protectionism in Japan: A Survey. Delbert A. Fitchett

No. 29. A Multisector Framework for Analysis of Stabilization and Structural Adjustment Policies: The Case of Morocco. Abel M. Mateus and others

No. 30. Improving the Quality of Textbooks in China. Barbara W. Searle and Michael Mertaugh with Anthony Read and Philip Cohen

The World Bank

Headquarters
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

Telephone: (202) 477-1234
Telex: WUI 64145 WORLDBANK
RCA 248423 WORLDBK
Cable Address: INTBAFRAD
WASHINGTONDC

European Office
66, avenue d'Iéna
75116 Paris, France

Telephone: (1) 47.23.54.21
Telex: 842-620628

Tokyo Office
Kokusai Building
1-1 Marunouchi 3-chome
Chiyoda-ku, Tokyo 100, Japan

Telephone: (03) 214-5001
Telex: 781-26838

ISSN 0259-210X / ISBN 0-8213-1081-1 / DP0030